THE CITY OF
SAN FERNANDO

October 19, 2020

2020 MULTI-HAZARD MITIGATION PLAN

The City of San Fernando is in the process of creating an update to the 2014 Multi-Hazard Mitigation Plan (Plan). The Plan identifies a range of natural hazards within our community. The Plan also provides a list of mitigation action items that will be used in the future to reduce impacts from the identified hazards.

Part of the mandated approval process for the Plan requires the City to share the document with the general public as well as external agencies and to solicit input during the plan writing phase.

I am asking you to please review this draft version of the Plan and share your comments with me by November 2, 2020. If you are not able to provide your comments by this date, I will move forward with the understanding that you do not have any concerns and you are comfortable with the Plan as it is written. As a colleague in the field of emergency management, I am sure you understand the importance of sharing this information and I hope you will be able to find the time to assist me with this task.

Thank you in advance for your time and assistance with this project. I look forward to receiving your comments.

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October 9, 2020

Multi-Hazard Mitigation Plan

emergency planning consultants

THE CITY OF SAN FERNANDO

Credits

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 **Hazard Mitigation Planning Team** below.

Hazard Mitigation Planning Team:

Name	*Department*	*Position*
City of San Fernando		
Matthew Baumgardner	Public Works	Director
Kenneth Jones	Public Works	Management Analyst
Irwin Rosenberg	Police	Lieutenant
Emergency Planning Consultants		
Carolyn J. Harshman	Emergency Planning Consultants	President

Acknowledgements

City of San Fernando

- ✓ Joel Fajardo, Mayor
- ✓ Hector A. Pacheco Vice Mayor
- ✓ Sylvia Ballin, Council Member
- ✓ Robert C. Gonzales, Council Member
- ✓ Mary Mendoza, Council Member

Point of Contact

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

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Consulting Services

Emergency Planning Consultants

- ✓ Principal Planner: Carolyn J. Harshman, CEM, President
- ✓ Planning Assistant: Megan R. Fritzler

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Mapping

The maps in this plan were provided by the City of San Fernando, 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 San Fernando 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:**

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Part I: PLANNING PROCESS

Introduction

Q&A | ELEMENT A: PLANNING PROCESS | 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.

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) since 2005 has required state and local governments (including special districts and joint powers authorities) 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 of San Fernando emergency management planning programs. 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 San Fernando 2015 Multi-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.
- ✓ **Prepare implementation strategy -** Generally, high priority activities are recommended for implementation first. However, based on organizational 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.

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 the City of San Fernando staff working with Emergency Planning Consultants to create the hazard mitigation plan. **The Planning Team served as the primary stakeholders throughout the planning process.**

As required by DMA 2000, the Planning Team involved "the public". The general public and external agencies were invited to contribute to the mitigation plan during the plan writing phase. In addition, The Second Draft Plan was announced and posted on the _____ website on ___. External agencies were emailed information about the availability on the _____ website of the Second Draft Plan. Also, emails were sent to the City's Disaster Council and the City of San Fernando Resiliency Coalition.

The general public and external agencies served as secondary stakeholders with opportunity to contribute to the plan during the Plan Writing Phase of the planning process.

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 San Fernando 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 floodplain administrator.

NFIP Participation

The City of San Fernando participates in NFIP, and the FEMA FIRM maps for the City 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 San Fernando 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 is located within flood Zone X.

The NSFHA is not in any immediate danger from flooding caused by overflowing rivers or hard rains. However, it is 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, none of the properties within the City of San Fernando are designated as a Repetitive Loss Property (RLPs).

Planning Process

Throughout the project, the Planning Team served as the primary stakeholders while also making a concerted effort to gather information from the general public, external agencies (joint powers authority jurisdictions, utility providers, and special districts). In addition, the Planning Team solicited information from agencies and people with specific knowledge of hazards and past historical events, as well as building codes and facilities maintenance planning. The hazard mitigation strategies contained in this plan were developed through an extensive planning process involving the City of San Fernando staff, general public, and external agencies.

Following review and input by the Planning Team to the First Draft Plan, next (still during the Plan Writing Phase), the Second Draft Plan was shared with the general public and external agencies (joint powers authority jurisdictions, utility providers, special districts, etc.). The general public and external agencies 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 along with a request for a determination of "approval pending adoption".

Next, the Planning Team completed amendments to the Plan to reflect mandated input by Cal OES and FEMA. The Final Draft Plan was then posted in advance of the City of San Fernando's City Council public meeting. Any comments gathered were included in the staff report to the City of San Fernando City Council. Following adoption by the City Council, proof of adoption was forwarded to FEMA with a request for approval. The FEMA Letter of Approval was included in the Final Plan. The planning process described above is portrayed below in a progression:

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 **Plan Methodology and Planning Phases Progression** 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 Progression** below.

Figure: Planning Phases Progression

PLANNING PHASES PROGRESSION				
Plan Writing Phase (First & Second Draft Plan)	**Plan Review Phase (Third Draft Plan)**	**Plan Adoption Phase (Final Draft Plan)**	**Plan Approval Phase (Final Plan)**	**Plan Implementation Phase**
• Planning Team input – research, meetings, writing, review of First Draft Plan • Incorporate input from the Planning Team into Second Draft Plan • Invite public and external agencies via email and web posting to review, comment, and contribute to the Second Draft Plan • Sent Cal OES a copy of the Second Draft Plan requesting a courtesy review. • Incorporate input into the Third Draft Plan	• Third Draft Plan sent to Cal OES and FEMA for approval pending adoption • Address any mandated revisions identified by Cal OES and FEMA into Final Draft Plan	• Post public notice of City Council meeting along with the Final Draft Plan • Final Draft Plan distributed to City Council in advance of meeting • Present Final Draft Plan to City Council for adoption • City Council adopts Plan	• Submit Proof of Adoption to FEMA with request for final approval • Receive FEMA Letter of Approval • Incorporate FEMA approval and City Council resolution into the Final Plan	• Conduct quarterly Planning Team meetings • Integrate mitigation action items into budget and other funding and strategic documents

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 of San Fernando'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.

The Third Draft Plan was submitted to Cal OES and FEMA for review and approval. FEMA issued an Approval Pending Adoption on _____ requiring the adoption of the Plan by the City of San Fernando City Council. The adoption resolution was submitted to FEMA along with a request for a FEMA Letter of Approval.

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. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions.

The City Council heard the item on _____. The City Council voted to adopt the updated Multi-Hazard Mitigation Plan. The Resolution of adoption by the City Council is in the **Attachments**.

Plan Approval

FEMA approved the Plan on _____. A copy of the FEMA Letter of Approval is in the **Attachments**.

FEMA issued an Approval Pending Adoption notice on _____. Upon adoption by the City Council, the resolution was forwarded to FEMA. The FEMA Letter of Approval was issued on _____. A copy of the FEMA Letter of Approval is in the **Attachments**.

Plan Methodology

The Planning Team discussed knowledge of hazards and past historical events, as well as building codes and facilities maintenance plans.

The rest of this section describes the mitigation planning process including 1) Planning Team involvement, 2) general public and external agency involvement; and 3) 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 **Planning Team Involvement** below.

Planning Team Involvement

The Planning Team consisted of representatives from different City departments with a role in hazard mitigation processes. The Planning Team served as the primary stakeholders throughout the planning process. The general public and 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 1: July 15, 2020	Planning Team Meeting 2: July 23, 2020	Planning Team Meeting 3: July 30, 2020	Planning Team Meeting 4: September 3, 2020	Planning Team Comment on First Draft Plan	Distribute Second Draft Plan to General Public and External Agencies	Review Input From Public, and External Agencies of the Second Draft Plan	Submit Third Draft Plan to Cal OES/FEMA for Approval Pending Adoption	Post Final Draft Plan in Advance of City Council Meeting	Present Final Draft Plan to City Council at Public Meeting for Plan Adoption	Submit Proof of Adoption to FEMA for Final Approval	Incorporate FEMA Approval into Final Plan
Matthew Baumgarden	X	X	X	X	X	X							
Kenneth Jones	X	X	X	X	X	X							
Irwin Rosenberg	X	X	X	X	X	X							
Carolyn Harshman	X	X	X	X	X	X							
Megan Fritzler	X												

Table: Planning Team Timeline

Tasks	May 2020	June	July	August	September	October	November	December	January 2021	February
Research										
Research for Risk Assessment	X									
Prepare HAZUS	X									
Plan Writing										
First Draft, Second Draft, Third Draft, Final Draft, Final	X	X	X	X	X	X	X	X		
Planning Team Meetings										
Meeting #1 MHMP Overview and Initial Hazard Briefing			X							
Meeting #2 HAZUS and Status of 2015 Mitigation Action Items			X							
Meeting #3 Future Mitigation Action Items			X							
Meeting #4 Review First Draft Plan					X					
Community Outreach (Review Second Draft Plan)										
Encouraging Public Participation in Household and Business Mitigation Activities						X				
Seek General Public and External Agencies Input to Second Draft Plan						X				
Approval and Adoption of Plan										
Submit Third Draft Plan to Cal OES/FEMA. Complete Mandated Revisions						X	X	X	X	
Receive FEMA's Approval Pending Adoption									X	
Post and Participate in City Council Meeting to Adopt the Final Draft Plan, Submit Proof of Adoption to FEMA										X
Receive FEMA Final Approval										X
Incorporate FEMA Final Approval into Final Plan										X

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 identify how the stakeholders were invited to participate in the process? (Requirement §201.6(b)(2))

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

Secondary Stakeholder 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 the City of San Fernando staff, general public and external agencies. All gathered input was incorporated into the Third Draft Plan prior to distribution to Cal OES and FEMA. For a specific

accounting of the date, source, information gathered, and use of information during the Plan Writing Phase, please see the attachments in the Attachments.

In advance of the City Council public meeting, the City of San Fernando staff (via Newsletter), general public (via public noticing) and external agencies (via email invitation) were informed of the Final Draft Plan and encouraged to participate in the public meeting. Any comments gathered were noted in the Planning Team's City Council Staff Report and added to the Final 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 of San Fernando 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 the City of San Fernando's operational guidelines. 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
Source: City of San Fernando Website

Resource Type	Resource Name	Ability to Support Mitigation
Department	Administration	*San Fernando operates under a Council-Manager form of government. The Council-Manager form is a system of local government that combines the strong political leadership of elected officials in the form of a council or other governing body, with the strong managerial experience of an appointed local government manager. Other appointed officers are the City Attorney and City Clerk. The City Manager serves as Chief Executive Officer of the City and the Executive Director of the Redevelopment Agency. He serves as an advisor to the City Council on policy items impacting the community and the City organization. The City Manager appoints the City's department heads and is responsible for ensuring that city services are performed to the highest standard in accordance with Council policies. The City Manager is responsible for the submission of the City's budget and implementation in support of City Council goals.*
Department	City Clerk	*The City Clerk department is responsible for a number of functions including:* • *City Council meeting agenda preparation and distribution.* • *Record and maintain legislative history of the City and the preparation of official minutes.* • *Conduct municipal elections in an efficient and accurate manner as mandated by law.* • *Publication and posting of notices of meetings, ordinances, and other City business as required by law.* • *Custodian of Records – preparation of responses to public records requests under the California Public Records Act.* • *Municipal Code maintenance and codification services.*

Resource Type	Resource Name	Ability to Support Mitigation
		• *Filing Officer for the Fair Political Practices Commission (FPPC).* • *Filing Officer for Statement of Economic Interest (Form 700) under the Conflict of Interest Code.*
Department	Community Development	*The Community Development (CD) Department provides services and administers programs related to the city's built environment. The CD Department works with businesses, property owners and residents in order to preserve and improve the quality of life in the City ensuring that San Fernando continues to be a great location to shop, work, and live. The CD Department is responsible for:* • *Advising and working with the City Council, Successor Agency, and Planning and Preservation Commission on decisions concerning the development and use of land resources in the community;* • *Ensuring development projects and proposed land uses are consistent with the City's General Plan goals and objectives and comply with the City's Zoning Code;* • *Review construction proposals and conducts inspections in order to ensure that projects comply with the City's building, health, and safety codes; and* • *Enforce City and Zoning Codes.*
Department	Finance	*The Finance Department is responsible for providing fiscal oversight and control to all City operating departments. As a central support function, the Finance Department administers the City's budget and works in partnership with other City departments to develop budgets, implement control measures, and maximize the value of the City's assets, including human capital. As such, the Department provides quality services in conformance with the highest professional standards and has received various awards for excellence in financial reporting and distinguished budget presentation by national and state organizations of municipal finance officers.* *The Finance Department's primary functions include: accounting, budgeting, business licensing, cashiering, short/long-term financial planning and reporting, technology networking services, payroll services, purchasing, risk management, vendor payments, utility billing, human resource management, and providing support to internal departments.*
Department	Police	*The San Fernando Police Department has been effective by working in partnership with residents, businesses, schools, religious organizations, neighborhoods, and other City services. The department fully embraces the philosophy of Community Oriented Policing, in which the San Fernando Police Department and the community work together to solve problems regarding crime, fear of crime, and quality of life issues.*
Department	Public Works	*The Public Works Department provides engineering services and capital planning to ensure a high quality of public infrastructure and is responsible for rehabilitating and restoring the City's infrastructure (i.e. facilities, streets, water pipelines, sewer system), providing safe and reliable water delivery, improving the flow of traffic, maintaining parkway streets and landscape, cleaning of City streets, overseeing transportation programs, managing the City's sanitary sewer system, and coordinating refuse and recycling programs.*
Department	Recreation and Community Services	*The mission of the Recreation and Community Services Department is to develop and implement programs and activities that provide for the*

Resource Type	Resource Name	Ability to Support Mitigation
		well-being and the personal development of the City's residents. The staff is dedicated to creating those experiences that provide for good citizenship, a sense of community, and for a better quality of life.
Plans	General Plan	*The 1987 General Plan establishes a statement of the future of the community and indicates how the City plans to respond to diverse human needs such as shelter, commerce, employment, recreation and the protection of health, safety and welfare. The General Plan establishes the manner in which these needs will be met by the adoption of the city policies for several areas of concern which are called "elements". Each "element" deals with a major aspect of the human and physical environment which makes up the San Fernando community. There are seven elements which are required to be included in a modern General Plan – land use, circulation, housing, open space, conservation, safety, and noise.*
Plans	Multi-Hazard Mitigation Plan	*The mission of the City of San Fernando Multi-Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City towards building a safer, more sustainable community. The mission of this update is to evaluate where the City has been and to provide leadership and direction for future mitigation planning.*

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 San Fernando Website
http://ci.san-fernando.ca.us/
Applicable Incorporation: Departments Information.

City of San Fernando General Plan (1987)
http://ci.san-fernando.ca.us/wp-content/uploads/2020/01/General-Plan-Up-To-Date.pdf
Applicable Incorporation: Information about hazards contributed to the hazard-specific sections in the City of San Fernando Hazard Mitigation Plan.

City of San Fernando Multi-Hazard Mitigation Plan (2014)
Applicable Incorporation: Information about hazards contributed to the hazard-specific sections in the City of San Fernando Hazard Mitigation Plan.

County of Los Angeles General Plan (2015)
http://planning.lacounty.gov/assets/upl/project/gp_final-general-plan.pdf

Applicable Incorporation: Information about the planning area and geography.

County of Los Angeles All-Hazards Mitigation Plan (2019)

http://file.lacounty.gov/SDSInter/lac/1062614_AHMPPublicDraft_Oct1.pdf
Applicable Incorporation: Information about hazards in the County contributed to the hazard-specific sections in the City of San Fernando Hazard Mitigation Plan and Previous Occurrences.

State of California Hazard Mitigation Plan (2018)

https://www.caloes.ca.gov/HazardMitigationSite/Documents/0022018%20SHMP_FINAL_ENTIRE%20PLAN.pdf
Applicable Incorporation: Used to identify hazards posing greatest threat to State.

HAZUS Maps and Reports

Created by Emergency Planning Consultants
Applicable Incorporation: Numerous HAZUS maps and reports have been included for Earthquakes to determine specific risks and impacts to the City of San Fernando

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

https://www.fema.gov/vi/media-library/collections/6
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: Repetitive Loss Information.

Local Flood Insurance Rate Maps

https://msc.fema.gov/portal/home
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.

Using HAZUS for Mitigation Planning (2018)

https://www.fema.gov/media-library-data/1540479624999-ab1eca852448e271f0de82cf2031a01b/Using_Hazus_in_Mitigation_Planning_20180820_Final_508_Compliant.pdf
Applicable Incorporation: HAZUS Information.

California's Fourth Climate Change Assessment: Los Angeles Region Report (2019)

https://www.energy.ca.gov/sites/default/files/2019-07/Reg%20Report-%20SUM-CCCA4-2018-007%20LosAngeles.pdf
Applicable Incorporation: Climate Information.

NOAA National Centers for Environmental Information, Climate at a Glance (2019)
https://www.ncdc.noaa.gov/cag/county/time-series
Applicable Incorporation: Data Image.

County of Los Angeles Public Health, Acute Communicable Disease Control (2019)
https://admin.publichealth.lacounty.gov/acd/WNVData.htm
Applicable Incorporation: Pandemic/Epidemic/Vector Borne Disease Information.

Part II: RISK ASSESSMENT

City Profile

Q&A | ELEMENT B3:

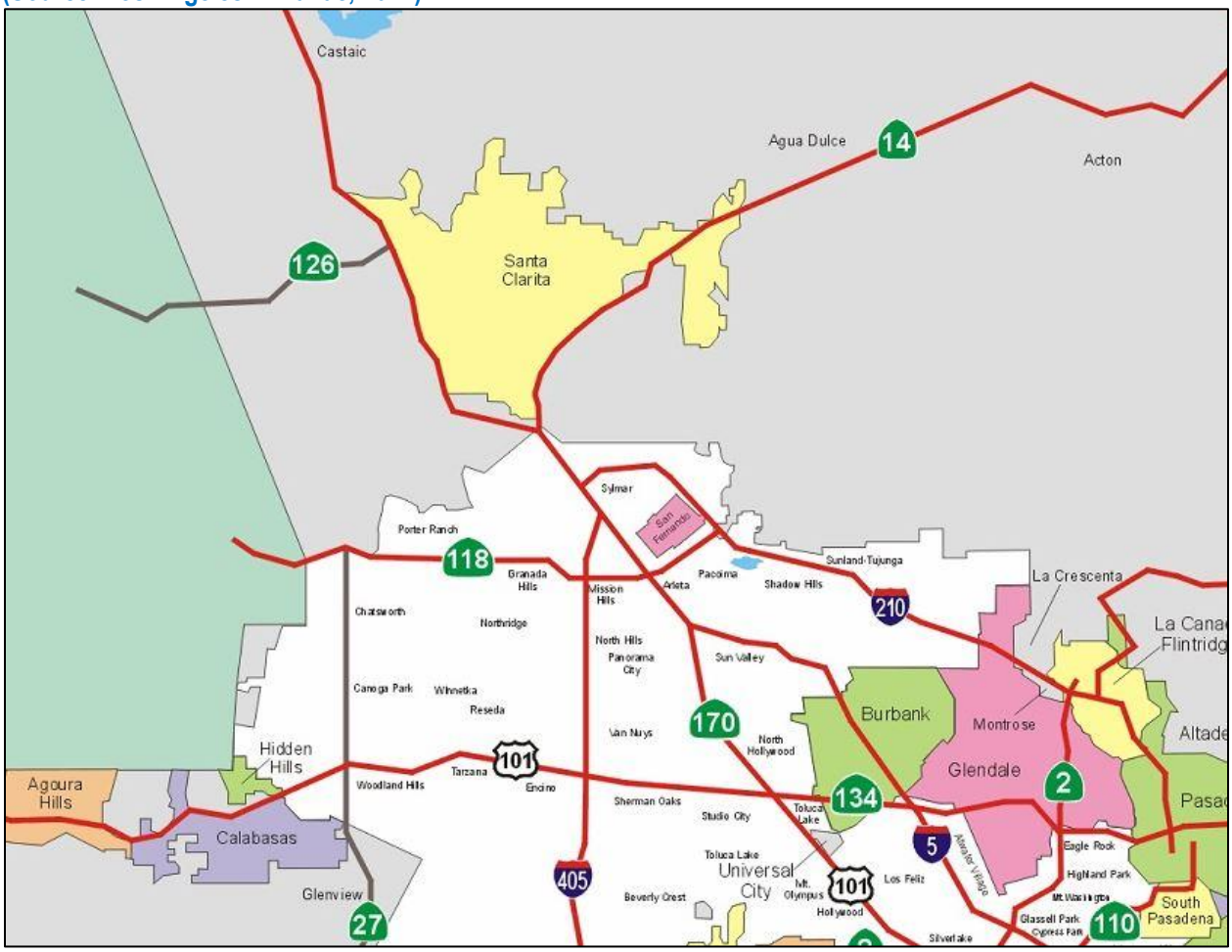
Q: Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(b)(3))
A: See **Location and the Environment** below.

Location and the Environment

According to the City of San Fernando website (2020), San Fernando was selected for settlement long before the rest of Los Angeles. The City grew out of the ranching activities surrounding Mission de San Fernando Rey, whose graceful porticoes still stand today. By the early 1800's the settlement had blossomed into a small trading center where farm crop, olives, wine, and thousands of livestock raised by the resident Indians were bought and sold. San Fernando enjoyed a brief gold rush in the 1840s when nuggets were discovered in a nearby canyon.

In 1874, San Fernando became the valley's first organized community, thus earning the title "First City of the Valley". With the arrival of the railroad two years later, town lots soared from $10 apiece to $150. The City of San Fernando is a community of attractive contrasts. What was once a land of farms and ranches adjoining the Mission de San Fernando Rey is now a vibrant center of manufacturing and commerce. San Fernando enjoys a sweeping view of the panoramic San Gabriel foothills and a sense of privacy; yet it is only minutes from downtown Los Angeles and only minutes away from other centers of commercial activity, thanks to a network of freeways and nearby airports. The City combines modern metropolitan conveniences with a close-knit community of friendly, civic-minded residents. Moreover, San Fernando proudly offers responsive city services, good access to city government, a large labor pool, a lower business tax than Los Angeles, and no utility tax. San Fernando has a rich history and flavor with a population of 24,564. San Fernando is an independent city within Los Angeles County.

Map: County of Los Angeles
(Source: Los Angeles Almanac, 2017)

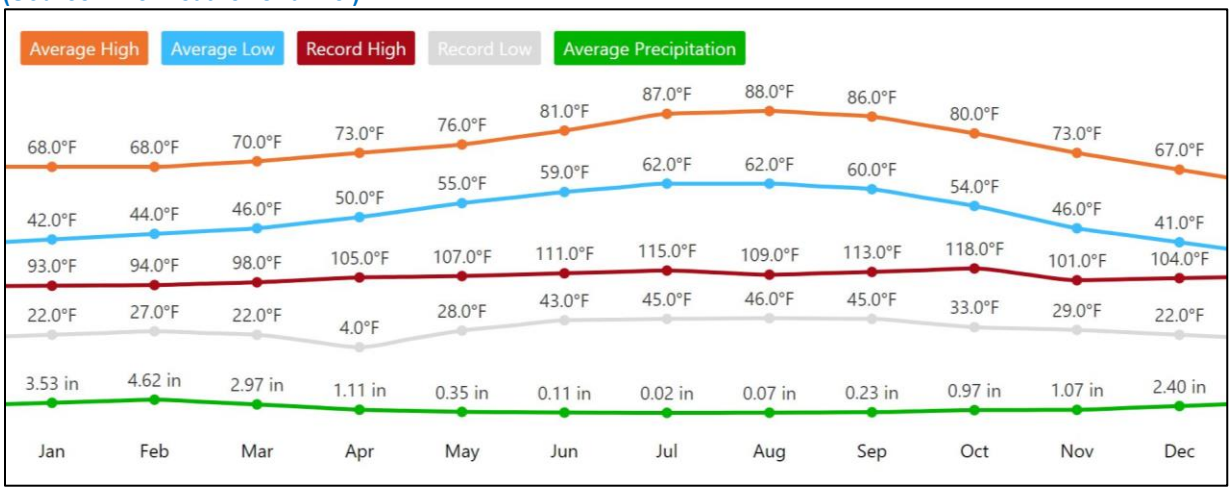


Climate

According to the City of San Fernando Website (2020), a warm sunny climate and plenty of recreational activities add to the City's drawing power. The weather is downright Mediterranean, with average rainfall of 12" – 17" and 44% humidity.

Data from The Weather Channel indicates the City experiences temperatures ranging from highs of 88 degrees in summer to lows of 41 degrees in winter. Typically, December is the coolest month, while August is the warmest.

Graph: Monthly Weather Data for the City of San Fernando (Source: The Weather Channel)



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*

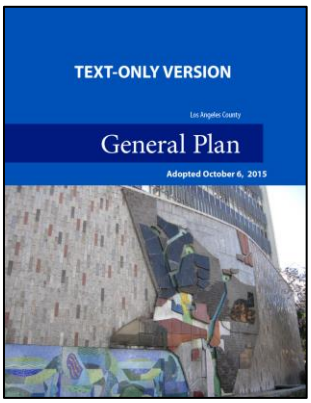
Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

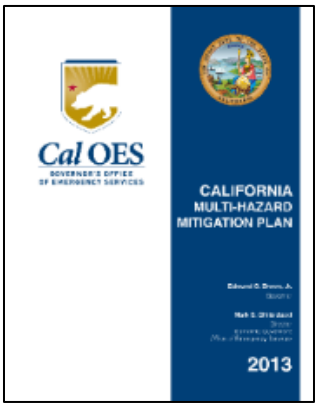
Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
A: See **Hazard Identification** below.

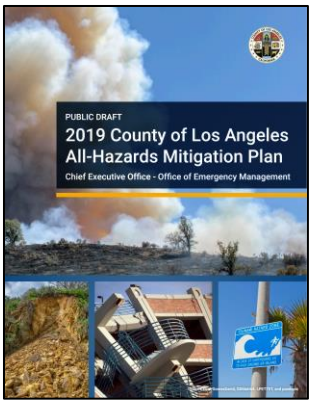
1) Hazard Identification

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 San Fernando 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 of San Fernando and its ability to deliver services. 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 1987 General Plan and 2014 Multi-Hazard Mitigation Plan. In addition, numerous internet resources and the County of Los Angeles All-Hazard 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 of San Fernando:

Earthquake | Wildfire | Flood | Windstorm | Epidemic/Pandemic/Vector-Borne Diseases

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 the City of San Fernando**.

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 the City of San Fernando (Source: Emergency Planning Consultants)

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
EQ –San Andreas M 7.8	3	1.35	4	1.20	4	0.60	1	0.10	**3.25**
EQ –Oak Ridge M 7.2	3	1.35	3	0.90	4	0.60	1	0.10	**2.95**
EQ –Newport-Inglewood M 7.2	3	1.35	3	0.90	4	0.60	1	0.10	**2.95**
EQ –Sierra Madre M 7.2	3	1.35	3	0.90	4	0.60	1	0.10	**2.95**
Epidemic/Pandemic/Vector-Borne Diseases	3	1.35	3	0.90	1	0.15	4	0.40	**2.80**
Windstorm	3	1.35	2	0.60	1	0.15	3	0.30	**2.40**
Wildfire	2	0.90	1	0.30	4	0.60	3	0.30	**2.10**
Flood	2	0.90	2	0.60	2	0.30	2	0.20	**2.00**

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of the City of San Fernando 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 of San Fernando Specific Hazard Analysis. **Table: Vulnerability: Location, Extent, and Probability for the City of San Fernando** 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 the City of San Fernando** 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 the City of San Fernando** 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 the City of San Fernando** 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 the City of San Fernando** 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 the City of San Fernando** below.

Table: Vulnerability: Location, Extent, and Probability for the City of San Fernando

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often) *	Previous Occurrences
Earthquake	Citywide	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. Earthquake would most likely originate from the San Andreas fault.	Likely	January 17, 1994: the Northridge earthquake, caused damage to streets, the sewer system, the water system, public buildings, and privately-owned residential and commercial structures in the City.
Wildfire	All portions except the Western portion	The City of San Fernando has a Moderate Fire Threat rating designated by CAL FIRE.	Likely	No significant events on record.
Flood	Northeast corner of the City in the commercial and industrial strip adjacent to the Pacoima Wash	The flooding potential to the City is greatest from the Pacoima Dam, especially in the event that it is at full capacity.	Possibly	No significant events on record.

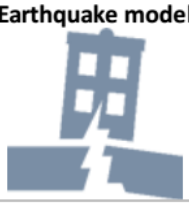
Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often) *	Previous Occurrences
Windstorm	Citywide	Historically, winds ranging from 55-60 mph have impacted the City.	Likely	No significant events on record.
Epidemic/Pandemic/Vector-Borne Diseases	Citywide	Quarantines, Shelter-in-Place Orders, Closed Business and Functions, Curfews.	Highly Likely	COVID-19, March 2020-present
* Probability is defined as: Unlikely = 1:1,000 years, Possibly = 1:100-1:1,000 years, Likely = 1:10-1:100 years, Highly Likely = 1:1 year				
[1] Uniform California Earthquake Rupture Forecast				

HAZUS-MH

The hazard maps in the Mitigation Plan were generated by Emergency Planning Consultants using FEMA's Hazards United States – Multi Hazard (HAZUS-MH) software program. Please see **Attachments – HAZUS** for complete reports. 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. It's important to note that the "project are" is based on Census Tracts not jurisdictional boundaries.

As per FEMA's HAZUS Guidebook, HAZUS is a GIS-based software that can be used to estimate potential damage, economic loss, and social impacts from earthquake, flood, tsunami and hurricane wind hazards. The HAZUS software includes nationwide general GIS datasets, and a model for the four natural disasters below. The model results can support the risk assessment piece of mitigation planning.

Graphic: Model Results to Support Risk Assessment for Mitigation Planning
(Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)

Earthquake model 	Estimates damages and losses to buildings, essential facilities, transportation, and utility lifelines from a single scenario or probabilistic earthquake analysis. There are also tools that allow the user to integrate earthquake hazard data generated outside of Hazus into the earthquake model. This model estimates debris generation, shelter requirements, casualties, and fire following an earthquake disaster.
Flood model 	Generates flood hazard data using nationwide hydrological datasets. There are also tools that allow the user to integrate flood hazard data generated outside of Hazus software into the flood model. This model estimates the expected levels of damage to infrastructure and buildings. Debris generation and shelter requirements, as well as agricultural losses, can be calculated with this model.
Tsunami model 	Can produce analyses that have several pre-tsunami and/or post-tsunami applications. Use of the methodology will generate an estimate of the consequences to a county or region of a "scenario tsunami," i.e., a tsunami with a specified inundation depth, velocity, and location. The resulting "loss estimate" generally will describe the scale and extent of damage and disruption that may result from the scenario tsunami.
Hurricane wind model 	Can create the wind hazard data from a historical or real-time event, probabilistic event, or from a user-defined scenario. Estimates of potential damage and economic loss to buildings can then be calculated. The storm surge analysis combines the wind and coastal flood model to simulate storm surge for historical, and manual hurricanes. The model combines the wind and flood losses.

HAZUS is packaged with datasets that include building inventories and infrastructure for the entire United States. Because HAZUS is currently built on GIS technology, the inventory and infrastructure datasets can be mapped and intersected with the hazard information created from the four models.

Following the intersection, HAZUS determines the effects of wind, ground shaking, and water depths on buildings and infrastructure to calculate losses and damages. The outputs and estimates can be used in hazard mitigation planning, emergency response, and planning for recovery and reconstruction.

Losses estimated in HAZUS are based on the accuracy of input data. Basic analysis can be developed using the default data and parameter data provided within HAZUS. Users can conduct more advanced analysis using more accurate data that is specific to the region, hazard, population, etc. User-supplied data improves the accuracy of inventories and/or parameters.

Advanced-level analyses may also incorporate data from third-party studies. The user must determine the appropriate level of analysis to meet the user's needs and resources.

HAZUS analysis can be performed at three different levels:

• A Level 1 basic analysis can be performed simply using the default data provided. This level of analysis is very coarse, and because the results will be subject to a much higher level of uncertainty, this should serve primarily as a baseline for further study. The user

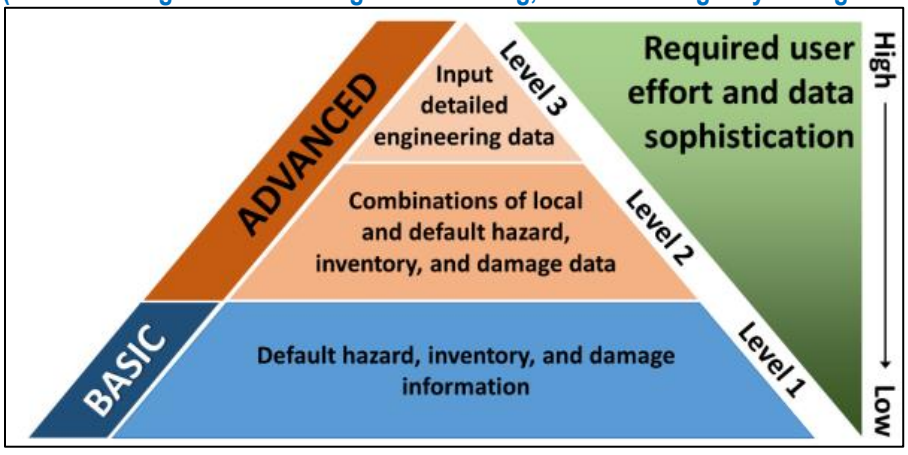
will still be able to produce basic maps and results. Limited additional data will be required to complete the flood analysis. Site specific input data produces more accuracy in vulnerability identification and loss estimation amounts. If the data is available, it is highly recommended that a user integrate site specific data to reduce uncertainty associated with the results of default data. Using a user defined depth grid, in the flood model, against default state data is classified as a level 1 analysis and is the recommendation of HAZUS Program.

• A Level 2 advanced analysis increases the accuracy and precision of an analysis by incorporating user-supplied data relevant to a given hazard. While the data included with the HAZUS software can be utilized to run a basic level one analysis, level two inputs are supplied by local sources and contain a higher level of detail. This can include datasets that model the hazards in more detail, or datasets that increase the accuracy of the inventory information. Incorporating more detailed data will improve the quality of the results. Level 2 is broadly defined as the incorporation of user-defined hazard and updated GBS or site-specific data.

• A Level 3 advanced analysis achieves the highest degree of precision and involves modifying or substituting the model parameters and/or equations, relevant to a given hazard. Users can modify inputs depending on the time and resources available. Keeping track of the data used is suggested so that any relationships between input and results is documented. It is usually done by advanced users experienced with both the hazard and the HAZUS software.

FEMA's Natural Hazard Risk Assessment Program (NHRAP) encourages users to conduct Level 2 or 3 analyses to improve the accuracy of results and recommends the use of user defined data (e.g., depth grids for all flood analysis) for mitigation planning.

Graphic: HAZUS Analysis Levels
(Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)



HAZUS creates credible estimates for losses and damages; datasets created on the local level typically provide greater detail than the datasets that are packaged with HAZUS (Level 1). Incorporating local datasets into the analysis will improve the results.

HAZUS Outputs

The user plays a major role in selecting the scope and nature of the output of a HAZUS analysis. A variety of maps can be generated for visualizing the extent of the losses. Numerical results may be examined at the level of the census block or tract or may be aggregated by county or region. There are three main categories of HAZUS outputs: direct physical damage, induced damage, and direct losses. Direct physical damage includes general building stock (GBS), essential facilities, high potential loss facilities, transportation systems, utility systems, and user defined facilities. Induced damage includes building debris, tree debris generation and fire following disaster occurrence. Direct losses include losses for buildings, contents, inventory, income, crop damage, vehicle loss, injuries, casualties, sheltering needs and displaced households.

Graphic: HAZUS Outputs
(Source: Using HAZUS for Mitigation Planning, Federal Emergency Management Agency, 2018)

Hazus Capabilities	**Earthquake** Ground Shaking Ground Failure	**Flood** Frequency | Depth Riverine | Coastal Surge	**Hurricane** Wind | Surge	**Tsunami** Depth | Momentum Flux | Runup | Velocity
Inputs				
Historic	✓		✓	
Deterministic	✓	✓	✓	✓
Probabilistic	✓	✓	✓	
User-supplied	✓	✓	✓	✓
Other supported inputs	Real-time & scenario USGS ShakeMaps	Risk MAP, User-supplied depth grids (ArcGRID, GeoTIFF, IMAGINE), HEC-RAS (.FLT)	Hurrevac, User-supplied wind files (.dat)	NOAA PMEL SIFT, State models
Direct Damage				
General Building Stock	✓	✓	✓	✓
Essential Facilities	✓	✓	✓	
Transportation Systems	✓	✓		
Utility Systems	✓	✓		
User-Defined Facilities	✓	✓	✓	✓
Induced Damage				
Fire Following	✓			
Debris Generation	✓	✓	✓	
Direct Losses				
Cost of Repair	✓	✓	✓	✓
Income Loss	✓	✓	✓	✓
Agricultural		✓		
Casualties	✓			✓
Shelter and/or Evacuation Needs	✓	✓	✓	✓
Average Annualized Loss (AAL)	✓	✓	✓	

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.

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 **Critical Facilities** below.

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.

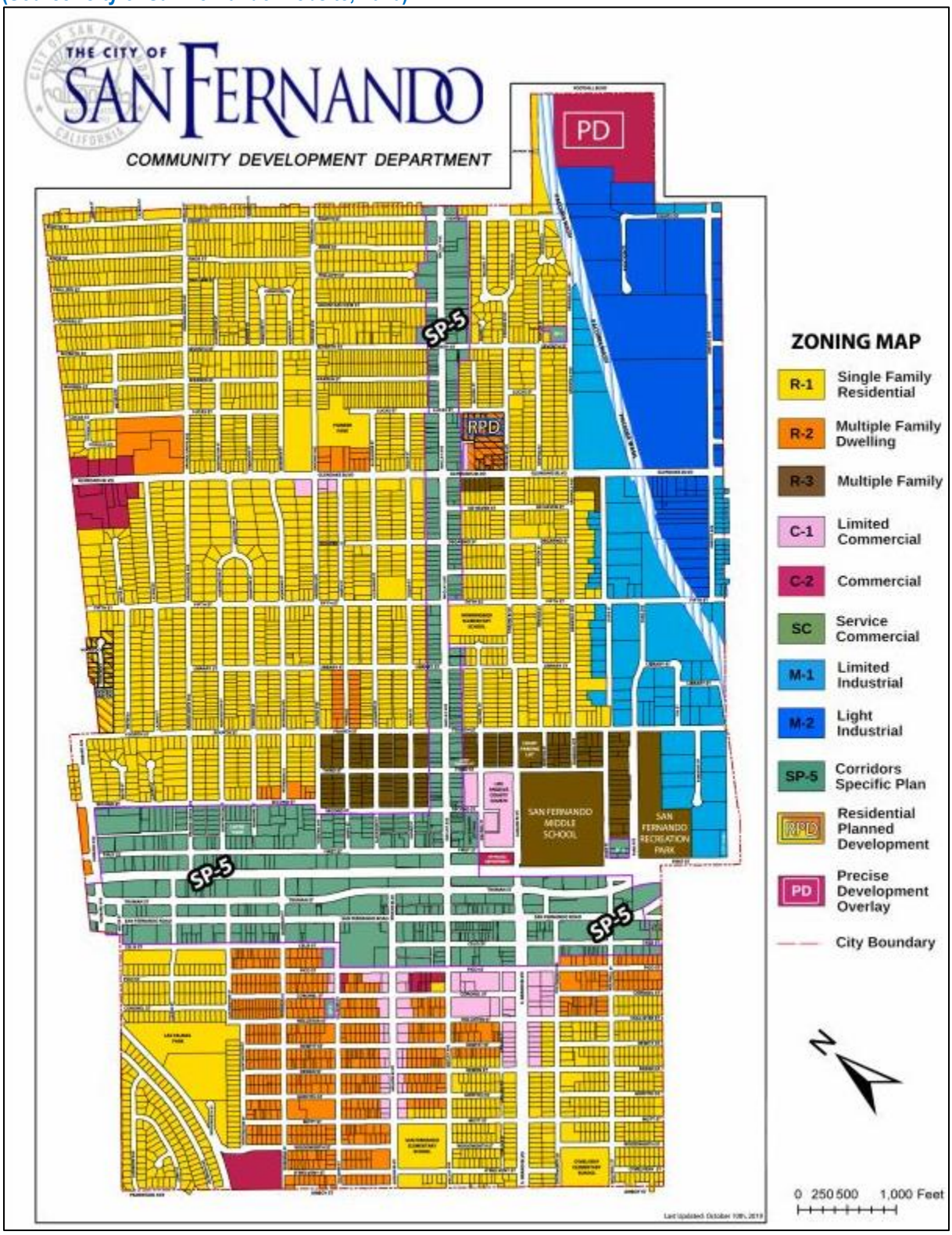
Hazardous Material Facilities include facilities housing industrial/hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

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

Table: Critical Facilities Vulnerable to Hazards
(Source: City of San Fernando Website, 2020)

City of San Fernando Critical Facilities	Earthquakes	Wildfires	Flood (100-Year Flood Plain)	Windstorm	Epidemic/Pandemic/Vector-Borne Diseases
City Hall 117 Macneil Street	X	X		X	X
Police Facility 910 First Street	X	X		X	X
City Yard 120 Macneil Street	X	X		X	X
Recreation Park 208 Park Avenue	X	X		X	X
Reservoir 3	X	X		X	X
Reservoir 4	X	X		X	X
Las Palmas Park 505 S. Huntington Street	X	X		X	X

Map: City of San Fernando Zoning Map
(Source: City of San Fernando Website, 2020)



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.

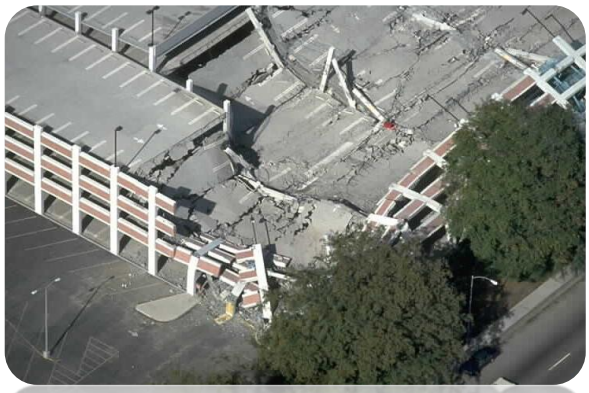
Changes in Development

The City of San Fernando was first organized into a community in 1874. It began as farmland and ranches, and it is now a hub for commerce and manufacturing. Primarily comprised of single family residential housing, San Fernando is also a home for commercial and industrial spaces.

Since the 2014 MHMP, 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. Furthermore, the Planning Team concluded the overall vulnerability to identified hazards remained the same.

Earthquake Hazards

Hazard Definition



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.

One 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.

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 San Fernando** below.

Previous Occurrences of Earthquakes in the City of San Fernando

The two most significant earthquakes to affect the City are the 1971 Sylmar and the 1994 Northridge. According to the City of San Fernando Multi-Hazard Mitigation Plan Update (2014), the 1971 Sylmar earthquake struck on February 9th with an epicenter 6 miles northeast of Sylmar. The earthquake caused 65 deaths and millions of dollars in property loss. There were numerous cases of bridge, freeway, and hospital destruction. The San Gabriel Mountains directly east of San Fernando rose several feet. Surface breaks caused by faulting during the earthquake appeared across the northeastern corner of the San Fernando Valley.

The second major earthquake affecting the City was the Northridge earthquake on January 17th, 1994. This event was measured at a magnitude of 6.7 and caused extensive damage to structures and utilities in the City of San Fernando. The earthquake originated in a hidden fault approximately 8 miles below the surface of the San Fernando Valley and about 20 miles west of the City of San Fernando. The earthquake caused a rupture along the fault line that traveled upwards in a northwestern direction. The fault, now called the Oak Ridge or Northridge fault system, intersected with a branch of the Sierra Madre fault, which was responsible for the 1971 Sylmar earthquake. The earthquake lasted approximately 15 seconds. After the initial event,

aftershocks of varying magnitude occurred at the rate of 1,000 a day for several weeks. The earthquake caused substantial damage to streets, the sewer system, the water system, public buildings, and privately-owned residential and commercial structures in the City. In the first six months following this disaster, the City spent approximately $1.8 million and over 9,100 person hours on earthquake-related activities.

Table: History of Earthquakes Impacting the City of San Fernando
(Source: City of San Fernando Multi-Hazard Mitigation Plan, 2014)

Year	Location	Impact
1933	Long Beach	No damage to the city
1971	Sylmar	65 deaths, millions of dollars in property loss
1987	Whittier	No damage to the city
1994	Northridge	51 fatalities and 9,000 injuries, thousands of structures damaged, $40 billion in economic loss

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

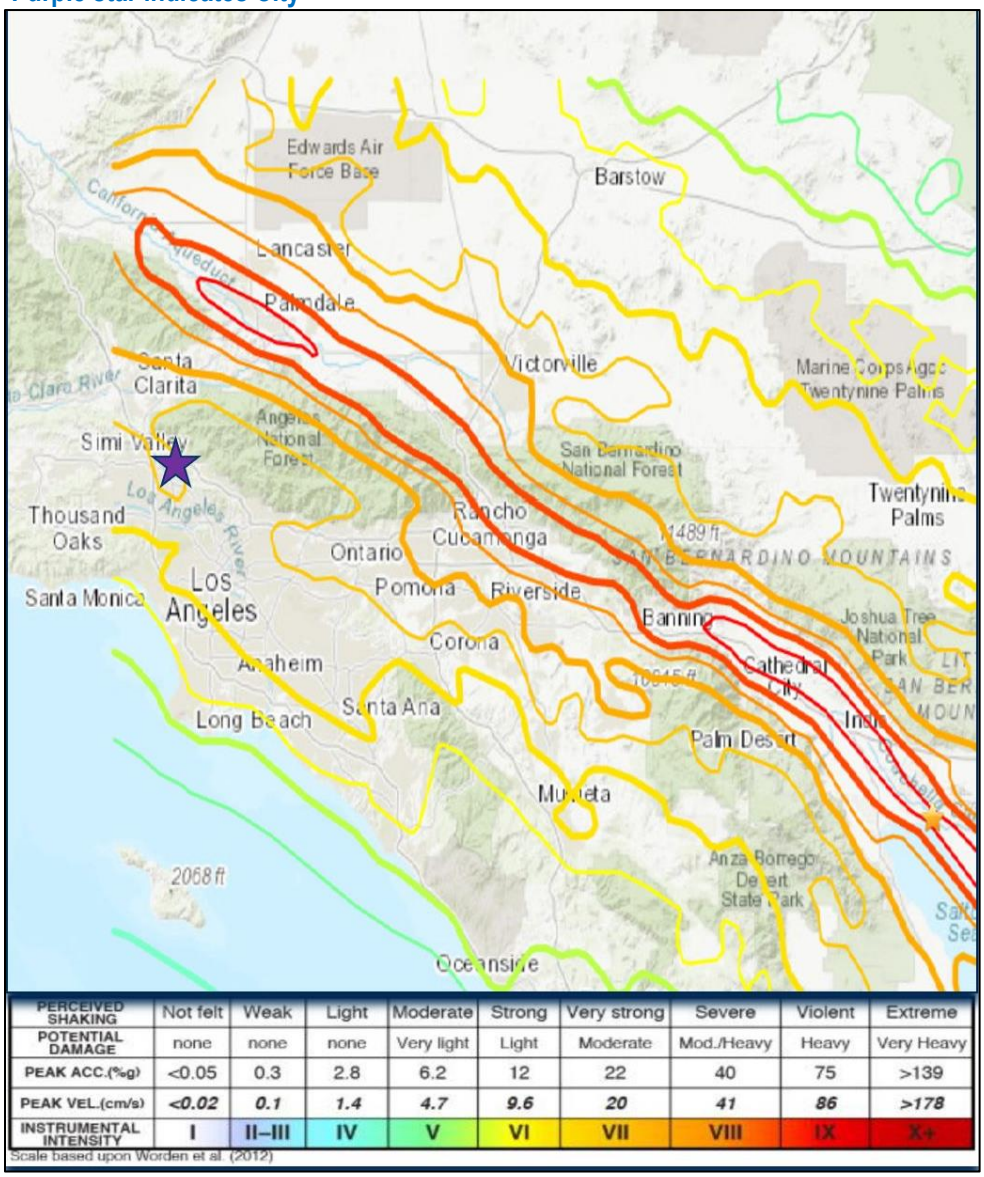
According to the City of San Fernando Multi-Hazard Mitigation Plan Update (2014), there are several faults that have the potential to impact the City of San Fernando. The San Andreas fault is considered a "master fault" because it is the boundary of the Pacific and North American geologic plates. Besides this fault, there are a number of active faults in the eastern San Fernando and northern San Gabriel valleys, including the Northridge, Newport-Inglewood, and Sierra Madre faults. The presence of so many active faults makes the City of San Fernando highly vulnerable to a major earthquake.

The segment of the San Andreas fault closest to the City of San Fernando is the Mojave segment, which is approximately 83 miles long. This segment extends from approximately Three Points (29 miles east of the 210 freeway near Sulphur Springs) southward to just northwest of Cajon Creek, at the southern limit of the 1857 rupture. Using a slip rate of 30±8 millimeters per year (mm/yr) and a characteristic displacement of 4.5±1.5 meters (m), scientists have derived a recurrence interval of 150 years for this segment. The Mojave segment is estimated to be capable of producing a magnitude 7.1 earthquake. Scientists have calculated that this segment has a 26 percent probability of rupturing sometime between 1994 and 2024.

San Andreas Fault Zone

The San Andreas Fault Zone potentially has a strong effect on the City of San Fernando. 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.

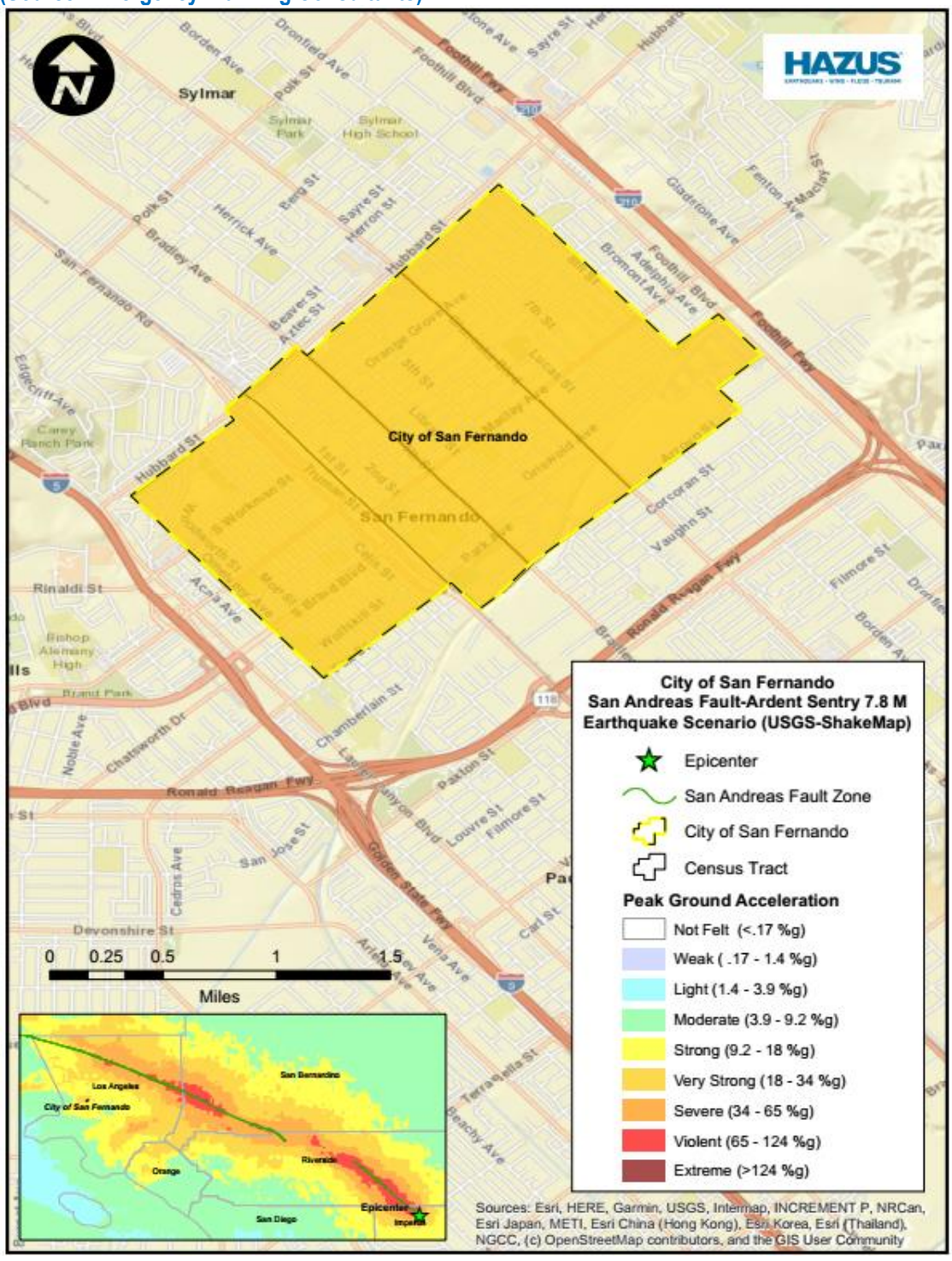
Map: Shake Intensity Map – San Andreas M7.8
(Source: USGS)
***Purple star indicates City**



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

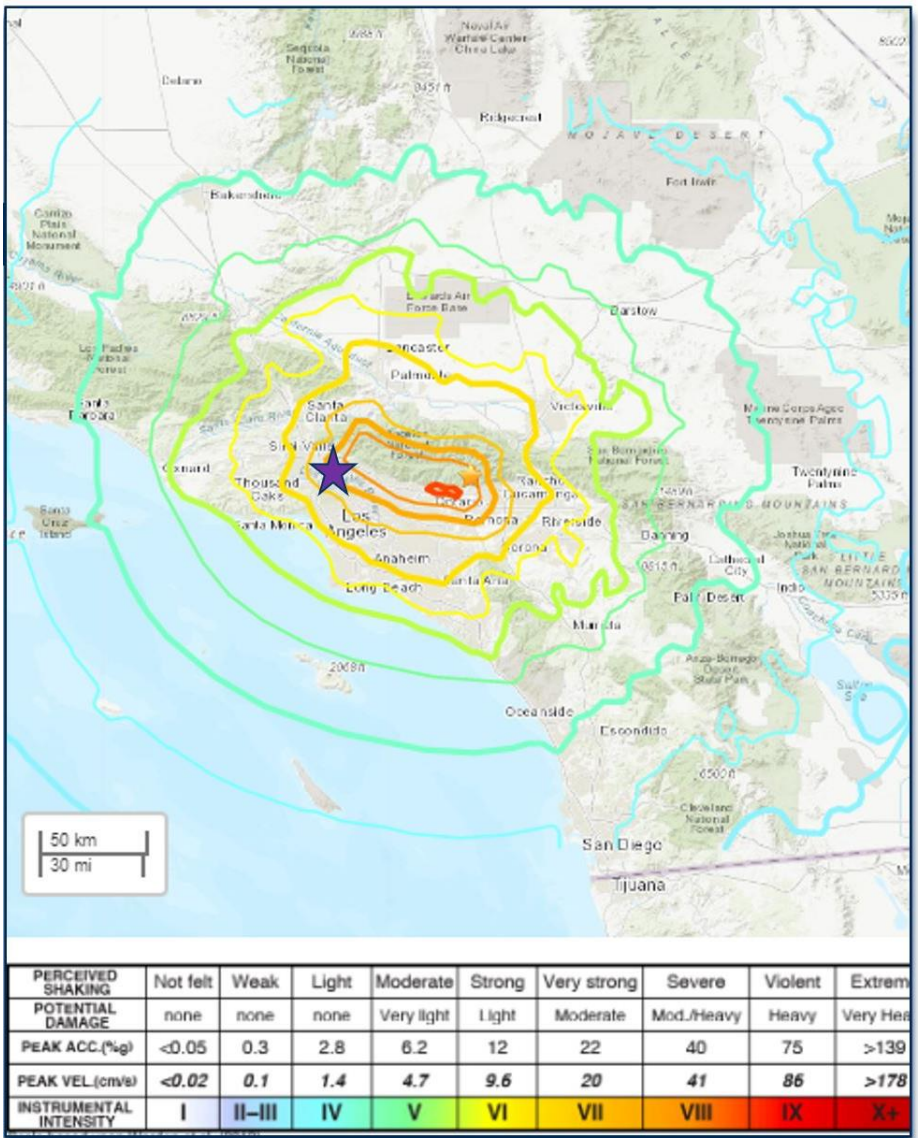
Map: HAZUS – San Andreas M7.8
(Source: Emergency Planning Consultants)



Sierra Madre Fault Zone

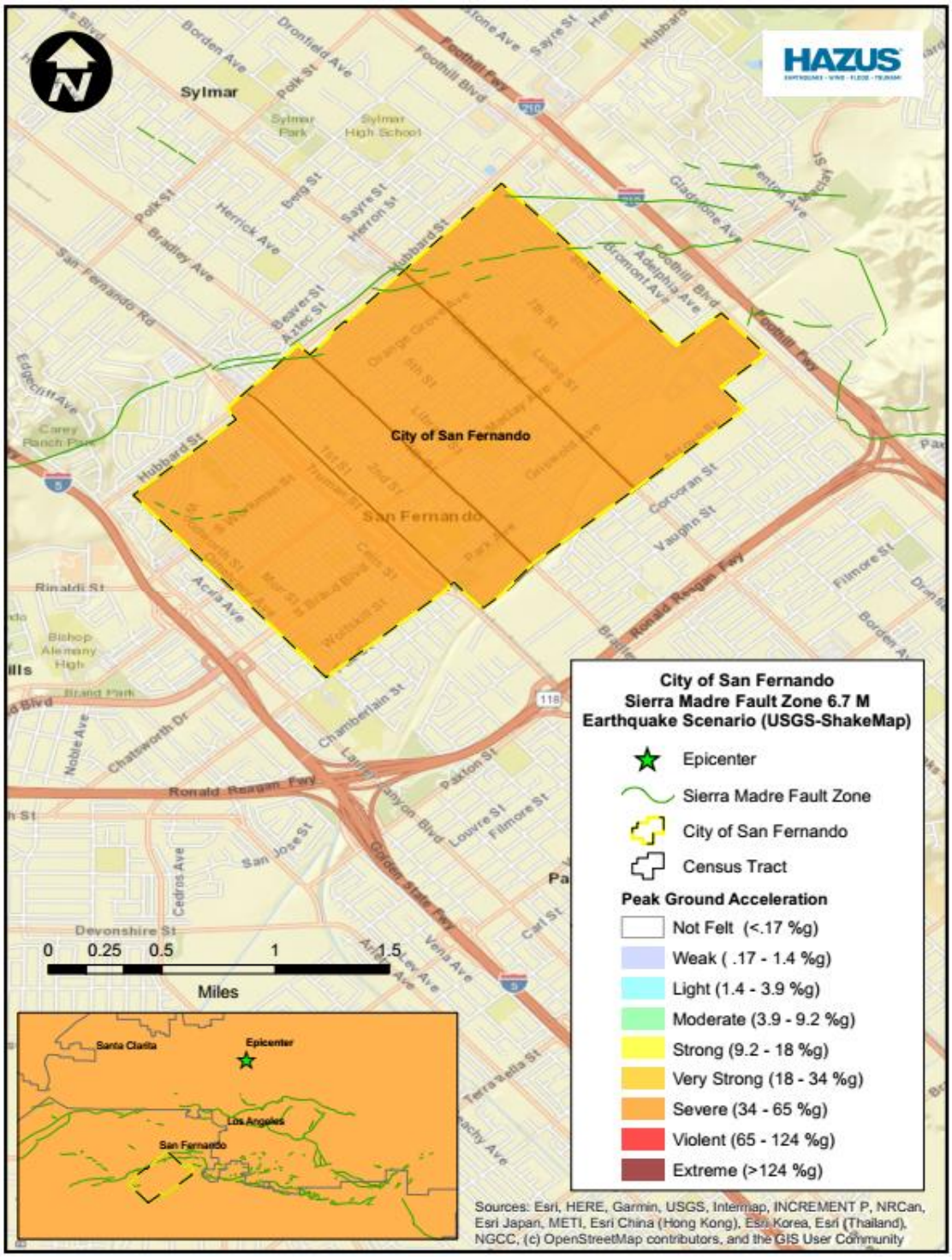
The Sierra Madre fault zone is a series of moderate angle, north-dipping, reverse faults (thrust faults). Movement along these frontal faults has resulted in the uplift of the San Gabriel Mountains. According to the Southern California Earthquake Data Center, rupture on the Sierra Madre fault zone (theoretically) 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.

Map: Shake Intensity Map – Sierra Madre M7.2
(Source: USGS)
***Purple star indicates City**



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extrem
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Hea
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

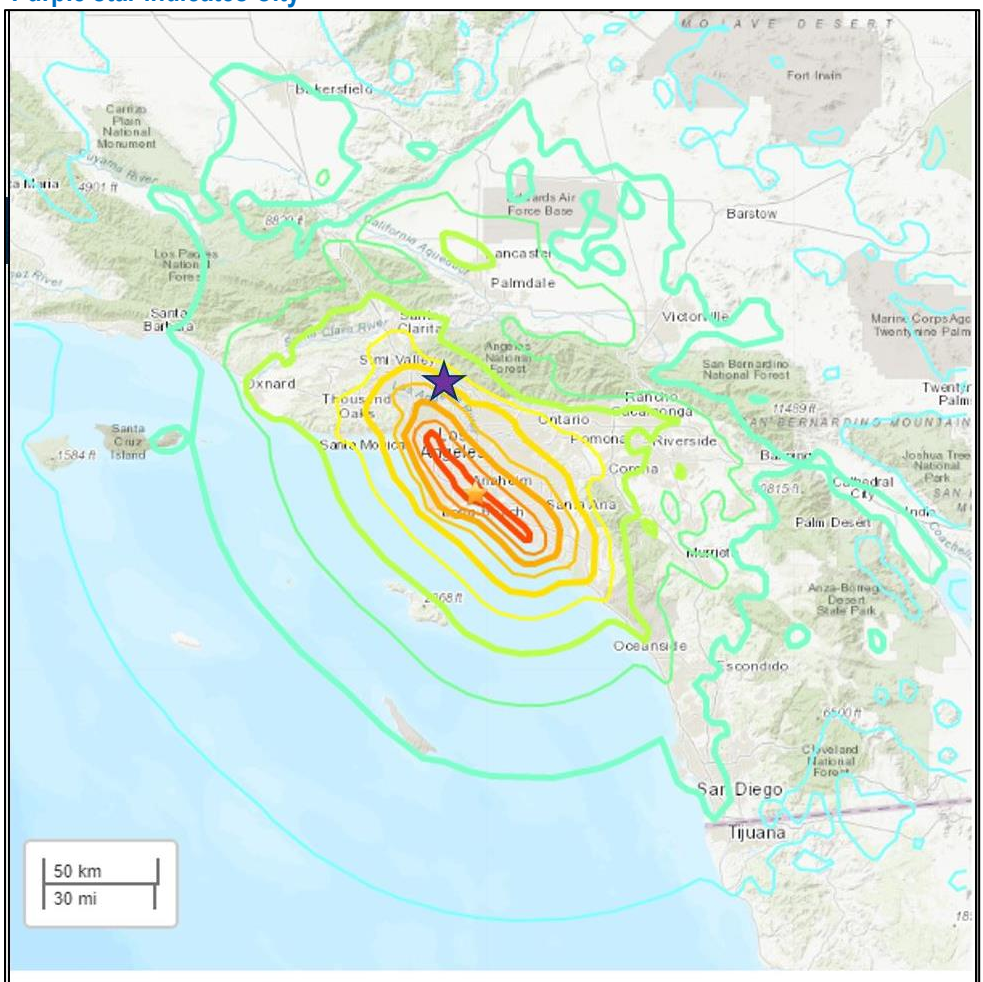
Map: HAZUS – Sierra Madre M7.2
(Source: Emergency Planning Consultants)



Newport-Inglewood Fault

The Newport-Inglewood Fault is a right-lateral fault with a length of 75 km in the Los Angeles Basin. The fault zone can easily be noted by the existence of a chain of low hills extending from Culver City to Signal Hill. South of Signal Hill, it roughly parallels the coastline until just south of Newport Bay, where it heads offshore, and becomes the Newport-Inglewood – Rose Canyon fault zone. The most recent rupture was on March 10, 1993 (M6.4) but was not a surface rupture.

Map: Shake Intensity Map – Newport-Inglewood M7.2
(Source: USGS)
***Purple star indicates City**



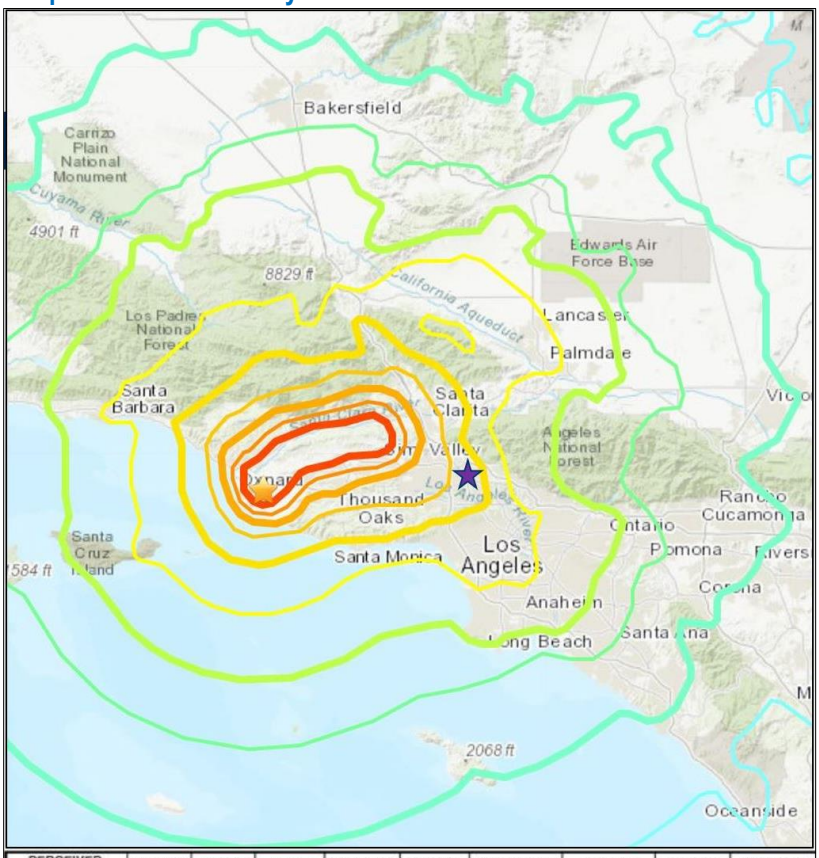
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Oak Ridge Fault

The Oak Ridge Fault is a thrust fault with a length of 90km. The fault drops south at an angle less than 45 degrees, meaning the epicenter of an earthquake on this fault could appear distant from the surface trace. The surface trace of the Oak Ridge thrust forms a ridge to the south of its trace and is roughly paralleled by both the Santa Clara River and California State Highway 126, from the town of Piru to the coast, just southeast of Ventura. The Oak Ridge thrust continues offshore, out to a point about 20 kilometers due south of Santa Barbara. The offshore segment is associated with a definite zone of active seismicity, though the only known Holocene surface rupture is found well onshore, between the towns of Bardsdale and Fillmore. At its eastern end, the Oak Ridge thrust becomes progressively more difficult to trace, and appears to be overthrust by the Santa Susana fault, thus becoming a blind thrust fault. Indeed, the fault associated with the 1994 Northridge earthquake is probably part of the Oak Ridge fault system, as it shares many of the characteristics of this fault. This blind thrust fault is known either as the Pico Thrust, named for the Pico Anticline (a geologic fold it is creating), or as the Northridge Thrust, for more obvious reasons. The fault has probable magnitudes between 6.5-7.5.

Map: Shake Intensity Map – Oak Ridge M7.2
(Source: USGS)
***Purple star indicates City**



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Earthquake Related Hazards

Ground shaking, landslides, and liquefaction 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.

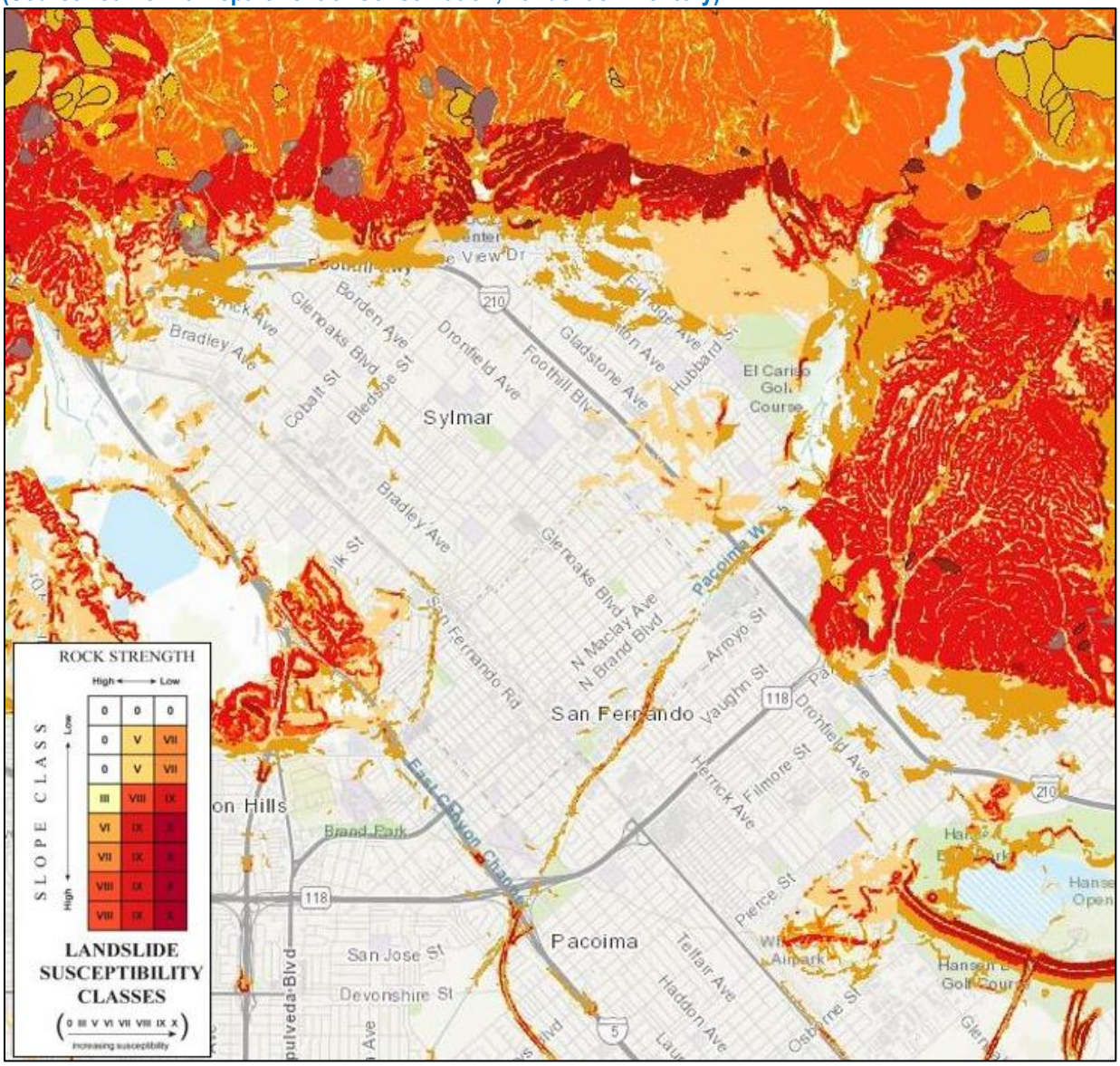
Earthquake-Induced Landslides

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.

Rock falls may happen suddenly and without warning but are more likely to occur in response to earthquake induced ground shaking, during periods of intense rainfall, or as a result of human activities, such as grading and blasting. Ground acceleration of at least 0.10g in steep terrain is necessary to induce earthquake-related rock falls.

Map: Landslide Exposure to the City of San Fernando shows the potential risk of earthquake-induced landslide risk within the City of San Fernando.

Map: Landslide Exposure to the City of San Fernando
(Source: California Department of Conservation, Landslide Inventory)



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.

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 San Fernando** below.

Impact of Earthquakes in the City of San Fernando

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to the City of San Fernando. 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 citizens as temporary facilities and relocations would likely be needed

Wildfire Hazards

Hazard Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels and exposing or possibly consuming structures. They often begin unnoticed and spread quickly. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A wildland/urban interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

Wildfire Characteristics

There are three categories of wildland/urban interface fire: The classic wildland/urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas; the mixed wildland/urban interface is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The occluded wildland/urban interface exists where islands of wildland vegetation occur inside a largely urbanized area. Certain conditions must be present for significant interface fires to occur. The most common conditions include hot, dry and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel topography, weather, drought, and development.

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 Wildfire in the City of San Fernando** below.

Previous Occurrences of Wildfire in the City of San Fernando

The most recent significant wildfire event to impact the City was the Saddle Ridge Fire in October of 2019, which burned 8,799 acres across the foothills of the San Fernando Valley, the Santa Clarita Valley, and the Los Angeles county mountains. The warm and dry conditions of the Santa Ana winds combined with the dry vegetation fueled the fire. The fire destroyed 19 residences and damaged 88 additional residences. One civilian death was reported (due to cardiac arrest) and eight firefighters were injured.

According to the County of Los Angeles All-Hazards Mitigation Plan (2019), some of the county's most destructive fires have occurred since 2000, including:

Date	Fire	Damage
October 21, 2003	The Grand Prix Fire	Burned a total of 50,618 acres between Claremont and Lytle Creek. The fire destroyed 136 homes and was ruled "accidental but human-initiated."
October 25, 2003	The Simi Fire	Burned a total of 107,570 acres between Simi Hills and southeastern Simi Valley, in eastern Ventura County and western Los Angeles County, California. It destroyed 37 homes and 278 buildings. The cause of the fire remains unknown.
October 30, 2006	The Day Fire	Burned a total of 161,816 acres. The fire primarily burned the Los Padres National Forest. The cause of the fire was human ignited debris.
October 20, 2007	The Ranch Fire	Burned a total of 58,410 acres near Townsend Peak in the Angeles National Forest. The cause of the fire was equipment.
September 22, 2009	The Station Fire	Burned a total of 160,883 acres in the Angeles National Forest. The Station Fire is the largest recorded fire in Los Angeles County. It destroyed 89 residences and another 120 buildings of significance. Two firefighters were killed. The cause of the fire was arson.
November 8, 2018	The Woolsey Fire	Burned a total of 96,949 acres in Los Angeles and Ventura counties including Thousand Oaks, Agoura Hills, Calabasas, the Santa Monica Mountains, Malibu, and West Hills. A total of 1,643 structures were destroyed and 3 people were killed.
October 10, 2019	The Saddle Ridge Fire	Burned 8,799 acres across the foothills of the San Fernando Valley as well as the Santa Clarita Valley and the Los Angeles county mountains. The combination of warm and dry Santa Ana winds and critically dry vegetation allowed for significant fire growth. The fire destroyed 19 residences and damaged 88 additional residences. One civilian death was reported (due to cardiac arrest) and eight firefighters were injured.
October 24, 2019	The Tick Fire	Burned 4,615 acres in the Canyon County area of Los Angeles county. The combination of warm and dry Santa Ana winds and critically dry vegetation allowed for significant fire growth. The fire destroyed 23 homes and damaged 40 other residences. During the incident, four firefighter injuries were reported.

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

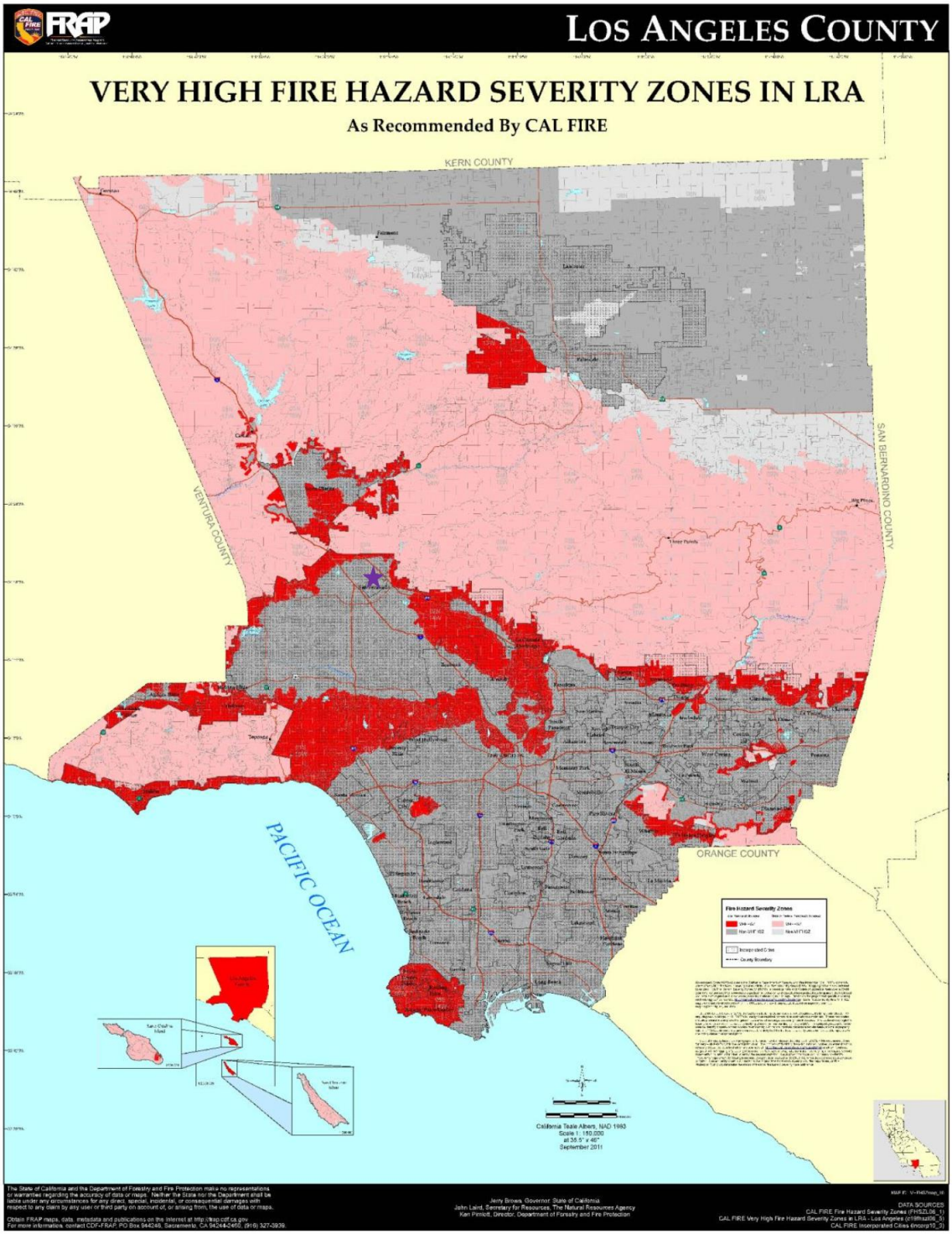
According to the City of San Fernando Multi-Hazard Mitigation Plan Update (2014), the San Fernando area typically has mild winters that lead to an annual growth of grasses and plants. This vegetation dries out during the hot summer months and is exposed to Santa Ana wind conditions in the fall. Winds in excess of 40 miles per hour are typical; gusts in excess of 100 miles per hour may occur locally. These winds tend to travel from north to south; however, when combined with winds generated from burning vegetation, wind direction is likely to be extremely erratic.

The map below shows County of Los Angeles Fire Hazard Severity Zones, including the Very High Fire Hazard Severity Zones identified in red. The VHFHSZ is the most severe fire hazard zone and contains the area most susceptible to full exposure to flames and embers during a wildfire. Although the City of San Fernando itself does not have any VHFHSZs within its jurisdictional boundaries, the City is surrounded by VHFHSZs to the northwest, north, northeast, east, and southeast, due to its location in the San Fernando Valley and the foothills of the Angeles National Forest.

In addition to the VHFHSZ map, CAL FIRE has also developed a State Fire Threat map showing the ratings of wildland fire threat based on the combination of potential fire behavior (fuel rank) and expected fire frequency (how often an area burns) under severe conditions. These two factors combine to create 4-threat classes ranging from moderate to extreme. Fire frequency is derived from 50 years of fire history data and fire behavior is derived from fuels and terrain data. The City of San Fernando has a Moderate Fire Threat rating.

Maps: Fire Hazard Severity Zones in Local Responsibility Area below shows the potential risk of wildfires to the City of San Fernando and the surrounding areas.

Map: Fire Hazard Severity Zones in Local Responsibility Area
(Source: CAL FIRE)
***Purple star indicates City of San Fernando**



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 Wildfire in the City of San Fernando** below.

Impact of Wildfire in the City of San Fernando

Wildfires and their impact vary by location and severity of any given wildfire event. Based on the risk assessment, it is evident that wildfires will continue to have potentially devastating economic impacts to the City of San Fernando. Impacts that are not quantified, but anticipated in future events, include:

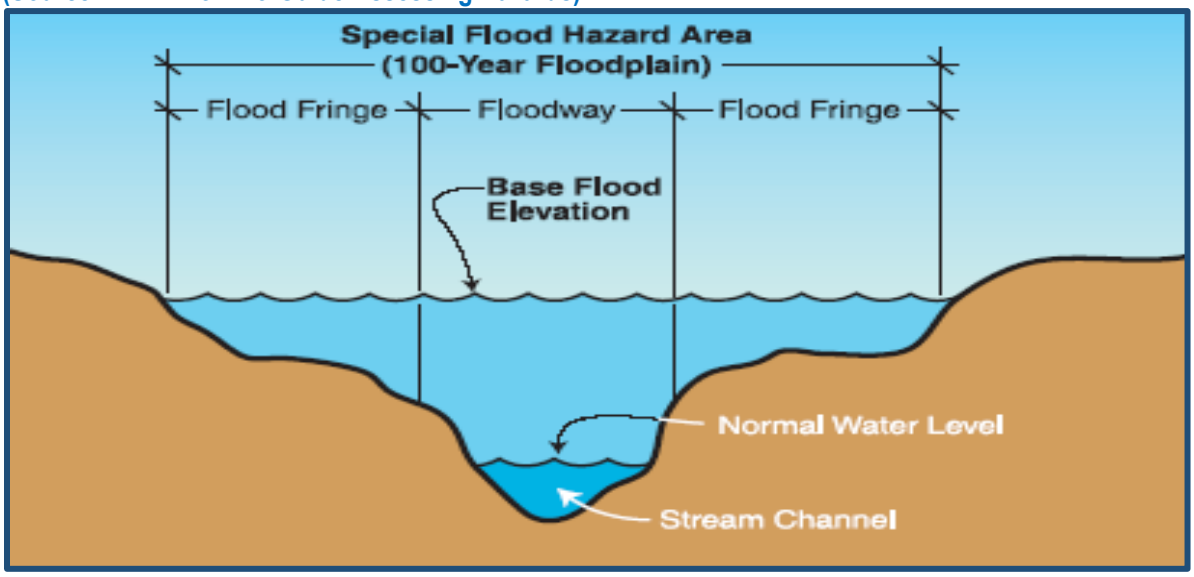
- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon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

Flood Hazards

Hazard Definition

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. 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.

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



Types of Flooding

Two types of flooding primarily affect the region: slow-rise or flash flooding. Slow-rise floods 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.

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 Flooding in the City of San Fernando** below.

Previous Occurrences of Flooding in the City of San Fernando

In light of channelization, there is no record of previous occurrences of flooding in the City. However, tragically in February 2017, 14-year-old Elias "Eli" Rodriguez went missing and was later found drowned miles away in the LA River in Los Feliz. In the midst of a large storm bring cold and rain, "Eli" didn't return home from school. According to the San Fernando Valley Sun, the rain made it hard to search, but family members contacted his friends and began to look for him and called for help. The community responded, some knocking on doors and posting flyers as media outlets reported on their search. When the sun broke through the storm days later, tragically a family member found "Eli's" body on a small concrete island in the river. It was speculated that "Eli" was swept away after trying to take a shortcut through the Pacoima Wash, behind his school, to get to his grandparents' house that was just on the other side. He was unaware that even a small amount of water could quickly carry you away to the bottom of the wash, with slick concrete making it impossible to get footing and the force of the water is deadly.

Photo: Elias "Eli" Rodriguez One-Year Anniversary Memorial
(Source: Rodriguez Family)

Previous Occurrences of Flooding in the Region

According to the County of Los Angeles All-Hazards Mitigation Plan (2019), the federal government has declared 13 flooding emergencies affecting Los Angeles County, including:

Date	Description
February 5, 1954	California Flood and Erosion (Disaster Declaration # [DR]-15)
December 23, 1955	California Flooding (DR-47)
April 4, 1958	California Heavy Rainstorms, Flood (DR-82)

March 6, 1962	California Floods (DR-122)
October 24, 1962	California Severe Storms, Flooding (DR-138)
February 25, 1963	California Severe Storms, Heavy Rains, Flooding (DR-145)
August 15, 1969	California Flooding (DR-270)
February 15, 1978	California Winter Storms Flooding (DR-547)
February 7 and 21, 1980	Southern California Winter Storms (DR-615)
December 21, 1988	Coastal Storms (DR-812)
February 12 and 19, 1992	California Winter Storms (DR-935)
January 7, 1993-February 19, 1993	California Winter Storms (DR-979)
January 18, 2017-January 23, 2017	California Severe Winter Storms, Flooding, and Mudslides (DR-4305)

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 San Fernando Multi-Hazard Mitigation Plan Update (2014), the probability of damage by flooding is low. The City is located in an area of low annual rainfall; the dam outside the City limits is normally maintained at one-quarter of its capacity, and has a sophisticated monitoring system that provides early warning of a structural failure; and a wash system that can rapidly direct water out of the City limits is well-maintained. The qualitative term "low" indicates the environmental factors (low rainfall) combined with the current flood mitigation (the dam/wash system combined with operational restrictions on water storage) make the possibility of flooding remote or slight.

The City is not situated within a floodplain. The last flooding was in the 1930s and occurred prior to the completion of the Los Angeles River flood-control system. The estimates from the Los Angeles County Department of Public Works indicate that the only part of the City susceptible to possible flooding is the commercial/industrial strip that is adjacent to the Pacoima Wash. This strip is approximately one block wide on either side of the wash. The Los Angeles County Flood Control engineers believe that temporary flooding up to six feet could occur in this area if the Pacoima Dam was filled to capacity and suffered a complete failure. Because the dam is no longer allowed to fill to capacity and the average rainfall is so low, the probability of this type of flood event is very slight.

The City of San Fernando lies directly west of Pacoima Canyon and the Pacoima Dam. There

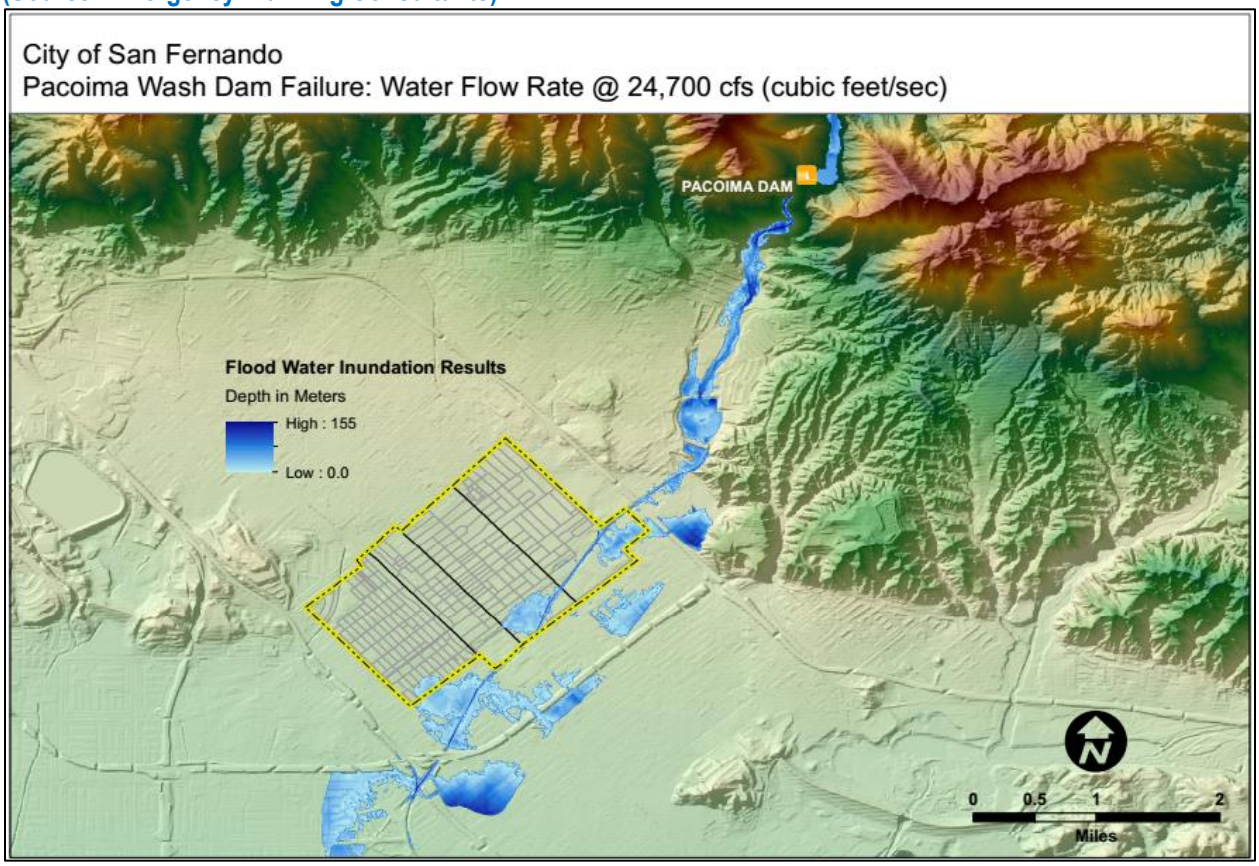
are several dry streams and washes that empty out of the foothills northeast of the City. This water is channeled through the Pacoima Wash, which travels for a mile across the northeast corner of the City. The wash is a concrete-bottomed, stone-lined channel approximately 35 feet wide at the top and between 12 and 14 deep. The walls of the wash are supported by an earthen berm which is several feet taller than the wash structure. The wash is capable of rapidly channeling any water through and out of the City.

Pacoima Dam

San Fernando is directly west of Pacoima Canyon, which is blocked by the Pacoima Dam. The capacity at the spillway is 6,060 acre feet of water. Due to seismic activity in the last 30 years the Pacoima Dam is kept at 25%–30% capacity.

The California Division of Dam Safety placed a reservoir storage restriction on the dam after the 1994 Northridge Earthquake. The Pacoima Dam was strengthened, and the spillway capacity was increased. The reservoir storage restriction was lifted, but the County of Los Angeles is maintaining the restriction levels. Any changes to the structure of the dam are monitored by a global positioning satellite system which can measure deformity or increased stress loads. The monitoring system provides early warning to residents downstream from the dam. Any water released from the dam is carried away by the Pacoima Wash.

MAP: HAZUS Report, Pacoima Dam Inundation
(Source: Emergency Planning Consultants)



Although the Pacoima Dam is a direct threat to the City, the City has several precautions in place to ensure its safety. The dam capacity of 25-30%, the low average rainfall, the Pacoima Wash, and the satellite monitoring system are all measures to protect and alert the City of potential damage.

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

The City of San Fernando 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.

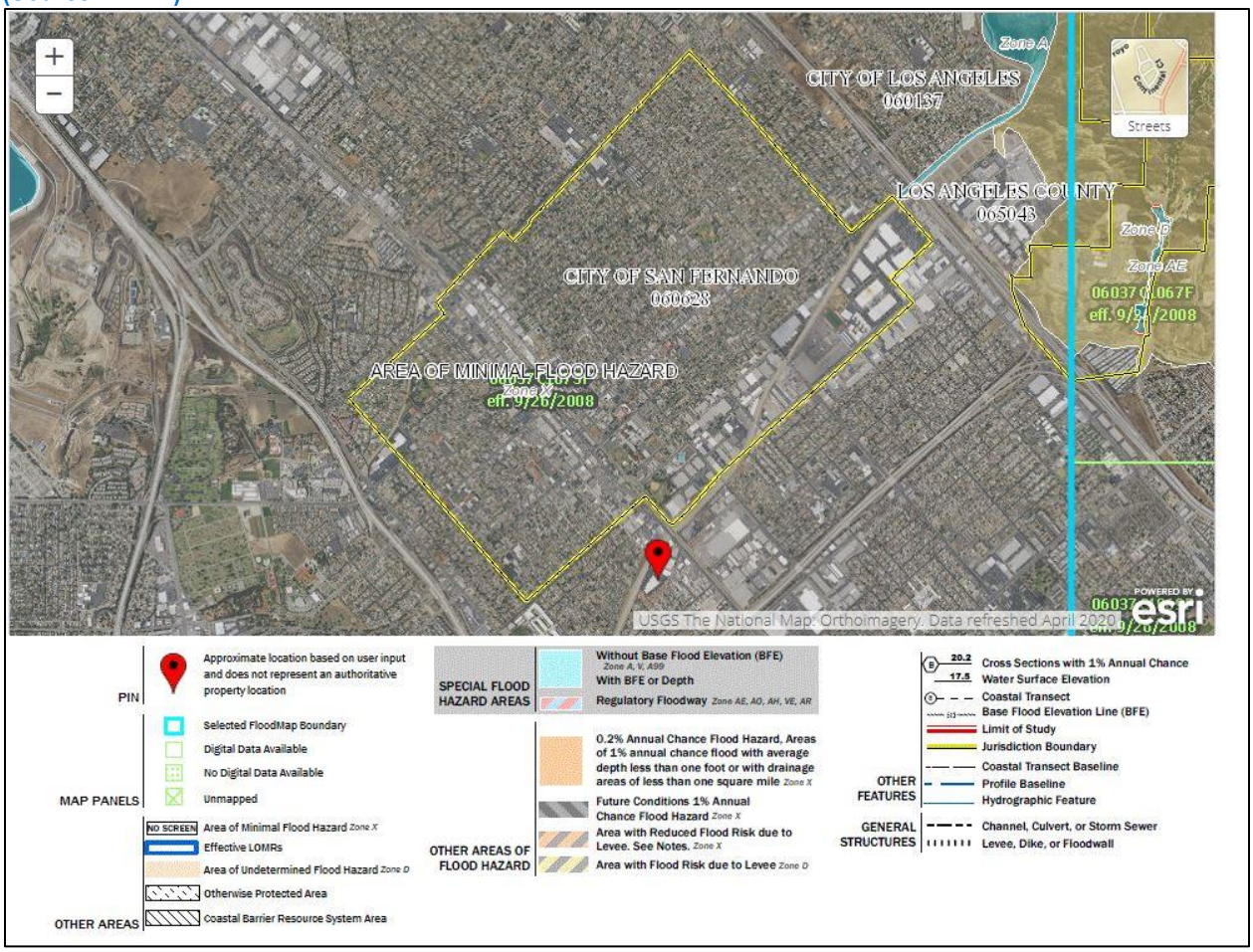
The City has participated in the NFIP (Community ID#060628) since February 1976. In 2006, the City adopted Ordinance 1572 to regulate the construction of buildings in areas prone to flooding. The ordinance empowers the City Community Development Director to oversee mitigation efforts to lower the risk from flood damage in areas prone to flooding. These efforts include use of flood-

resistant building materials, employment of construction techniques designed to minimize damage from flooding, and drainage systems that are adequate to remove standing water.

The City is located on Panel 060628 in the FIRM index. The analysis of the National Flood Insurance Program is that San Fernando is not in a 100-year floodplain, as shown in the figure below. Although the City of San Fernando itself does not have any floodplain zones within its boundaries, there are some "Zone A" flood zones (areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies) within the City's vicinity. These zones are based on California Department of Water Resources Flood Awareness, Regional Studies, and US Army Corps of Engineers Comprehensive Study analyses and have been determined to be potential flood areas and have a 1 percent chance of flooding each year with an average water depth of one foot. Therefore, San Fernando has a moderate to low risk for flooding.

These areas are shown below in **Map: FEMA Flood Insurance Rate Map**.

Map: Flood Insurance Rate Map for the City of San Fernando, #060628 (Source: FEMA)



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 do not 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.
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.

ZONE	DESCRIPTION
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

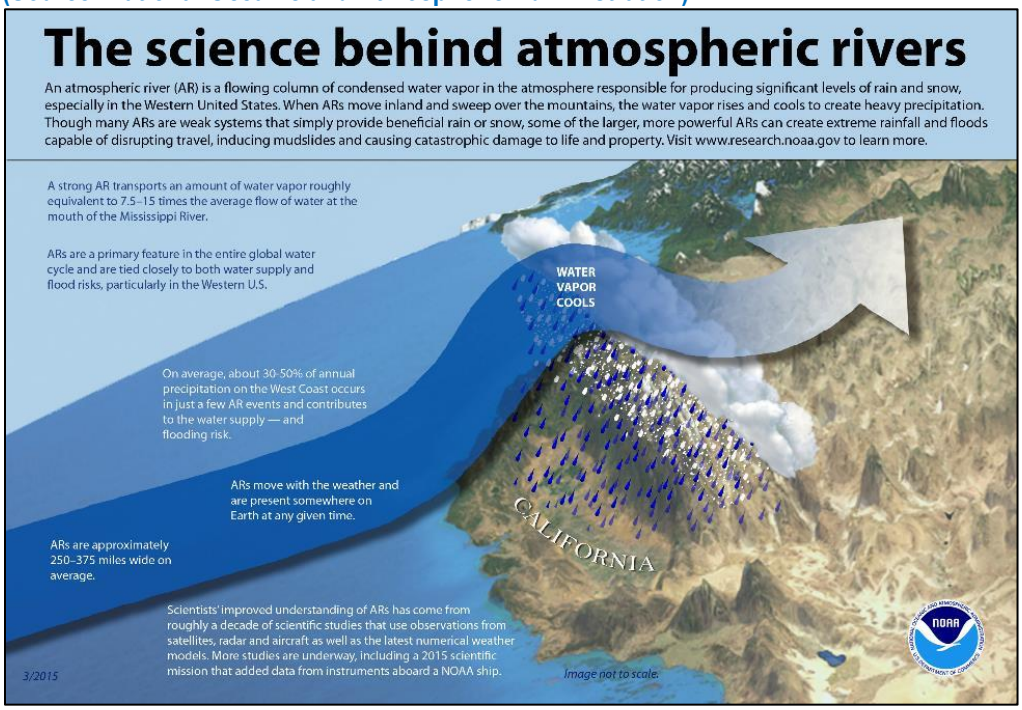
ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

Atmospheric Rivers

According to the National Oceanic and Atmospheric Administration (NOAA), atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow.

Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides, and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that can bring moisture from the tropics near Hawaii over to the U.S. West Coast.

Graphic: Atmospheric Rivers
(Source: National Oceanic and Atmospheric Administration)



While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from December 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by December 22, the first full day of winter.

NOAA research (e.g., NOAA Hydrometeorological Testbed and Cal Water) uses satellite, radar, aircraft and other observations, as well as major numerical weather model improvements, to better understand atmospheric rivers and their importance to both weather and climate.

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 San Fernando** below.

Impact of Flooding in the City of San Fernando

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the region during specific times. Based on the risk assessment, it is evident that floods will continue to have potential economic impacts to the City of San Fernando. Impacts that are not quantified, but 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 citizens as temporary facilities and relocations would likely be needed

Windstorm Hazards

Hazard Definition

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. According to most accounts, they 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 is Susceptible to Windstorms?

Life and Property

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 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 an area, 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 project area. 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 the project area 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.

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 San Fernando** below.

Previous Occurrences of Windstorms in the City of San Fernando

The City has not directly experienced devastation from windstorm hazards. However, neighboring communities in the foothills of the San Gabriel Mountains endured toppled trees, power outages, and millions of dollars' worth of damage due to the 2011 Santa Ana winds. Based on local history, most incidents of high wind in the County of Los Angeles 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 affect the county. Between 2015-2019, the County of Los Angeles experienced 49 wind related events with gusts reaching 79mph. Although the region did not suffer fatalities or serious injuries, the high winds fueled devastating Thomas Fire (2017). Below is a history of wind related events (magnitude 60 and above) in the County of Los Angeles within the last five years:

Table: High Wind, Strong Wind and Tornado Events in Los Angeles County, 2015-2019 (Source: NOAA, Storm Events Database)

Date	Location	Magnitude
11/15/2015	Los Angeles County Mountains Excluding the Santa Monica Range	63 knots MG
11/15/2015	Santa Clarita Valley	62 knots MG
12/11/2015	Los Angeles County Mountains Excluding the Santa Monica Range	69 knots MG
12/25/2015	Los Angeles County Mountains Excluding the Santa Monica Range	66 knots MG
01/22/2017	Los Angeles County Mountains Excluding the Santa Monica Range	72 knots MG
01/27/2017	Los Angeles County Mountains Excluding the Santa Monica Range	66 knots MG
01/27/2017	Santa Monica Mountains Recreation Area	56 knots MG
02/12/2017	Los Angeles County Mountains Excluding the Santa Monica Range	62 knots MG
10/09/2017	Santa Monica Mountains Recreation Area	65 knots MG
10/09/2017	Santa Clarita Valley	58 knots MG
12/04/2017	Santa Monica Mountains Recreation Area	62 knots MG
12/04/2017	Los Angeles County Mountains Excluding the Santa Monica Range	63 knots MG
01/28/2018	Los Angeles County Mountains Excluding the Santa Monica Range	61 knots MG
04/12/2018	Los Angeles County Mountains Excluding the Santa Monica Range	60 knots MG
11/08/2018	Santa Monica Mountains Recreation Area	63 knots MG
03/12/2019	Los Angeles County Mountains Excluding the Santa Monica Range	61 knots MG
04/09/2019	Los Angeles County Mountains Excluding the Santa Monica Range	64 knots MG
11/25/2019	Los Angeles County Mountains Excluding the Santa Monica Range	77 knots MG
12/17/2019	Los Angeles County Mountains Excluding the Santa Monica Range	61 knots MG

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 San Fernando Multi-Hazard Mitigation Plan Update (2014), incidents of high winds in the City of San Fernando are the result of the Santa Ana wind conditions. Santa Ana wind events and sporadic tornado activity have been known to negatively impact the local community. Windstorm events can be expected, perhaps even annually, across widespread areas of Southern California. Obviously, the City of San Fernando and surrounding region can be adversely impacted during a windstorm event. This can result in the involvement in the City of San Fernando's emergency response personnel during a wide-ranging windstorm or microburst tornado like activity.

Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create 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 community, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

Graphic: Santa Ana Winds
(Source: AccuWeather)

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 San Fernando** below.

Impacts of Windstorms in the City of San Fernando

Based on the risk assessment, it is evident that windstorms will continue to have potentially devastating economic impacts to the City of San Fernando. 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 citizens as temporary facilities and relocations would likely be needed

Epidemic/Pandemic/Vector-Borne Diseases Hazards

Hazard Definition

According to the California State Hazard Mitigation Plan (2018), the California Department of Public Health has identified epidemics, pandemics, and vector-borne diseases as specific hazards that would have a significant impact throughout the State.

According to the Centers for Disease Control (CDC), an epidemic refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population area. A pandemic refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors – living organisms that can transmit infectious pathogens between humans, or from animals to humans.

Seasonal Influenza

Seasonal influenza, also known as the flu, is a disease that attacks the respiratory system (nose, throat, and lungs) in humans. Seasonal influenza occurs every year. In the U.S., the influenza season typically occurs from October through May, peaking in January or February with yearly epidemics of varying severity. Although mild cases may be similar to a viral "cold," influenza is typically much more severe. Influenza usually comes on suddenly; may include fever, headache, tiredness (which may be extreme), dry cough, sore throat, nasal congestion, and body aches; and can result in complications such as pneumonia. Persons aged 65 and older, those with chronic health conditions, pregnant women, and young children are at the highest risk for serious complications, including death.

Pandemic Influenza

A pandemic influenza occurs when a new influenza virus, for which there is little or no human immunity, emerges and spreads on a worldwide scale, infecting a large proportion of the human population. The 20th century saw three such pandemics. The most notable pandemic was the 1918 Spanish influenza pandemic that was responsible for 20 million to 40 million deaths throughout the world. There have been two pandemics in the 21st century; H1N1 in 2009, and the most recent COVID-19 outbreak in 2019. As demonstrated historically and currently, pandemic influenza has the potential to cause serious illness and death among people of all age groups and have a major impact on society. These societal impacts include significant economic

disruption that can occur due to death, loss of employee work time, and costs of treating or preventing the spread of influenza.

H1N1 Influenza

In 2009 a pandemic of H1N1 influenza, popularly referred to as the swine flu, resulted in many hospitalizations and deaths. Pandemic H1N1 influenza is spread in the same way as seasonal influenza, from person to person through coughing or sneezing by infected people. In April 2009, two kids living more than 100 miles apart in Southern California came down with the flu. By mid-April, their illnesses had been diagnosed as being caused by a new strain of H1N1 influenza. Persons infected with H1N1 experienced fever and mild respiratory symptoms, such as coughing, runny nose, and congestion. In some cases, symptoms were severe and included diarrhea, chills, and vomiting, and in rare cases respiratory failure occurred. The H1N1 virus caused relatively few deaths in humans. In the United States, for example, it caused fewer deaths (between 8,870 and 18,300) than seasonal influenza, which, based on data for the years 2014–2019, causes an average of about 40,000 deaths each year. The H1N1 virus was most lethal in individuals affected by chronic disease or other underlying health conditions.

COVID-19

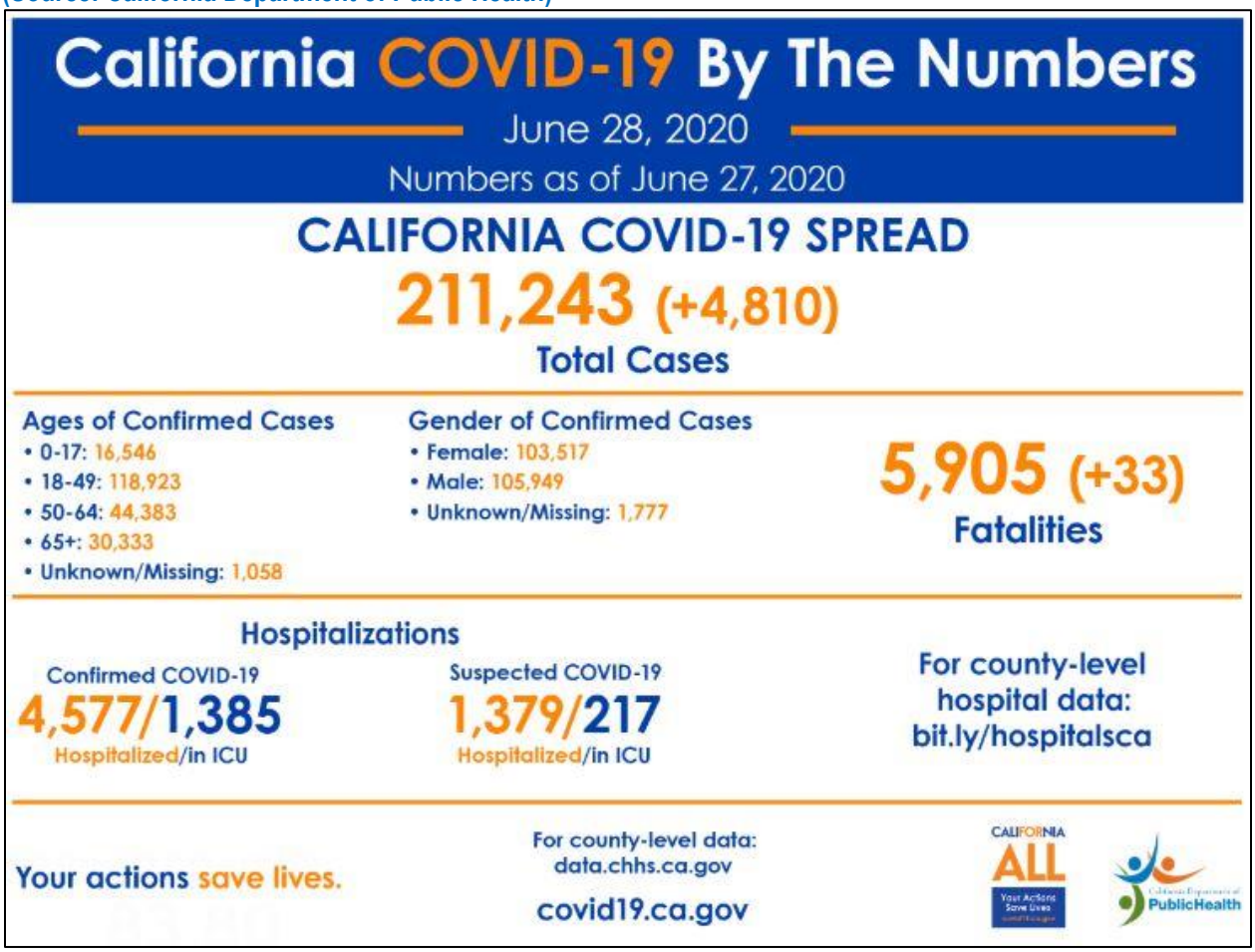
As of 2020, the CDC is responding to a pandemic of respiratory disease spreading from person to person caused by a novel (new) coronavirus. The disease has been named “Coronavirus Disease 2019” (abbreviated “COVID-19”). Coronaviruses are a large family of viruses that are common in people and many different species of animals, including camels, cattle, cats, and bats. Rarely, animal coronaviruses can infect people and then spread between people such as with Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).

According to the CDC, many of the patients at the epicenter of the outbreak in Wuhan, Hubei Province, China had some link to a large seafood and live animal market, suggesting animal-to-person spread. Later, a growing number of patients reportedly did not have exposure to animal markets, indicating person-to-person spread. Person-to-person spread was subsequently reported outside Hubei and in countries outside China, including in the United States. Most international destinations now have ongoing community spread with the virus that causes COVID-19, as does the United States.

On March 4, 2020, Governor Newsom proclaimed a state of emergency in the California in response to the COVID-19 outbreak. On March 19, 2020, Governor Newsom issued an executive order directing all residents immediately to heed current State public health directives to stay home, except as needed to maintain continuity of operations of essential critical infrastructure sectors.

According to the California Department of Public Health, as of June 28, 2020, the state of California had ~211,000 confirmed cases of COVID-19 and almost 6,000 people have died.

Figure: California COVID-19 by the Numbers
(Source: California Department of Public Health)



Avian Influenza

Avian Influenza, commonly referred to as "Bird Flu," remains a looming pandemic threat. Avian Influenza primarily spreads from birds to birds and rarely to humans. Public health experts continue to be alert to the possibility that an avian virus may mutate or change so that it can be passed from birds to humans, potentially causing a pandemic in humans. Some strains of the Avian Influenza could arise from Asia or other continents where people have very close contact with infected birds. This disease could have spread from poultry farmers or visitors to live poultry markets who had been in very close contact with infected birds and contracted fatal strains of Avian Influenza. Thus far, Avian Influenza viruses have not mutated and have not demonstrated easy transmission from person to person. However, if Avian Influenza viruses were to mutate into a highly virulent form and become easily transmissible from person to person, the public health community would be very concerned about the potential for an influenza pandemic. Such a pandemic could disrupt all aspects of society and severely affect the economy.

Vector-Borne Diseases

Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors. Every year there are more than 700,000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis and onchocerciasis. Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many of these vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it into a new host, after the pathogen has replicated. Often, once a vector becomes infectious, they can transmit the pathogen for the rest of their life during each subsequent bite/blood meal.

Mosquito-Borne Viruses

Mosquito-borne viruses belong to a group of viruses commonly referred to as arboviruses (for arthropod-borne). Although 12 mosquito-borne viruses are known to occur in California, only West Nile virus (WNV), western equine encephalomyelitis virus (WEE), and St. Louis encephalitis virus (SLE) are significant causes of human disease. WNV continues to seriously affect the health of humans, horses, and wild birds throughout the state. Since 2003, there have been over 6,000 WNV human cases with 248 deaths, and over 1,200 equine cases.

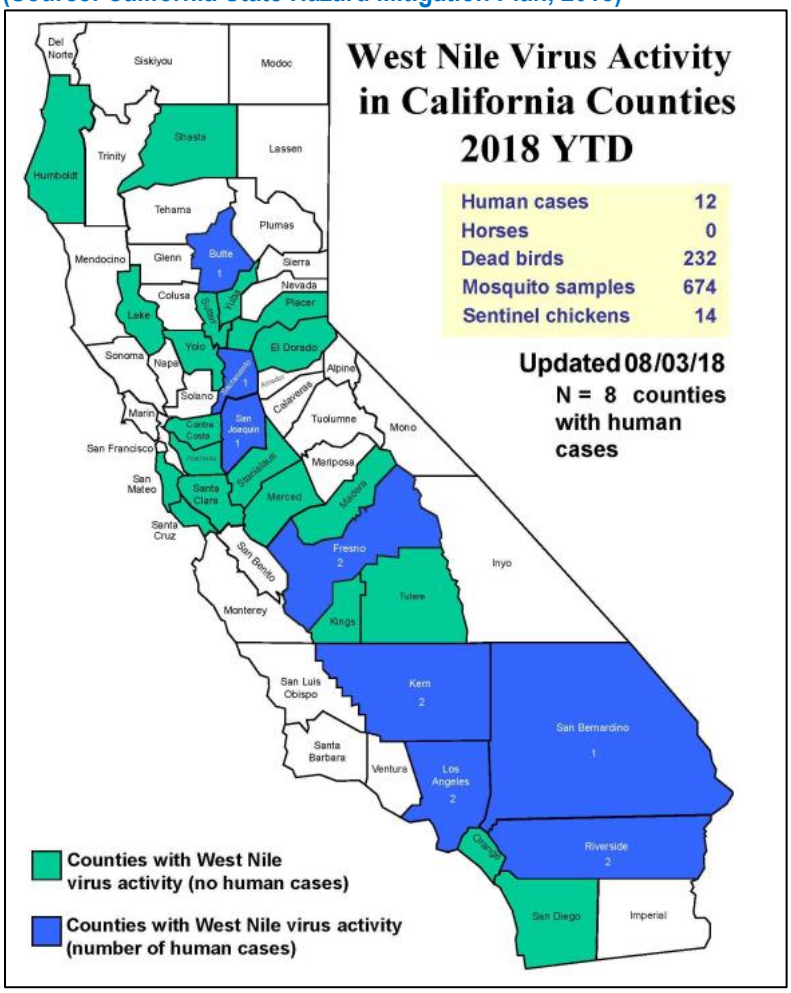
WNV first appeared in the United States in 1999 in New York and rapidly spread across the country to California in subsequent years. California has historically maintained a comprehensive mosquito-borne disease surveillance and control program including the Mosquito-borne Virus Surveillance and Response Plan, which is updated annually in consultation with local vector control agencies.

Climate change will likely affect vector-borne disease transmission patterns. Changes in temperature and precipitation can influence seasonality, distribution, and prevalence of vector-borne diseases. A changing climate may also create conditions favorable for the establishment of invasive mosquito vectors in California.

For most Californians, WNV poses the greatest mosquito-borne disease threat. Above-normal temperatures are among the most consistent factors associated with WNV outbreaks. Mild winters are associated with increased WNV transmission due, in part, to less mosquito and resident bird mortality. Warmer winter and spring seasons may also allow for transmission to start earlier. Such conditions also allow more time for virus amplification in bird-mosquito cycles, increasing the potential for mosquitoes to transmit WNV to people.

The effects of increased temperature are primarily through acceleration of physiological processes within mosquitoes, resulting in faster larval development and shorter generation times, more frequent mosquito biting, and shortening of the incubation period time required for infected mosquitoes to transmit WNV. During periods of drought, especially in urban areas, mosquitoes tend to thrive more due to changes in stormwater management practices. Mosquitoes in urban areas can reach higher abundance due to stagnation of water in underground stormwater systems that would otherwise be flushed by rainfall. Runoff from landscape irrigation systems mixed with organic matter can also create ideal mosquito habitat. Drought conditions may also force birds to increase their utilization of suburban areas where water is more available, bringing these WNV hosts into contact with urban vectors.

Map: West Nile Virus Activity in California Counties
(Source: California State Hazard Mitigation Plan, 2018)

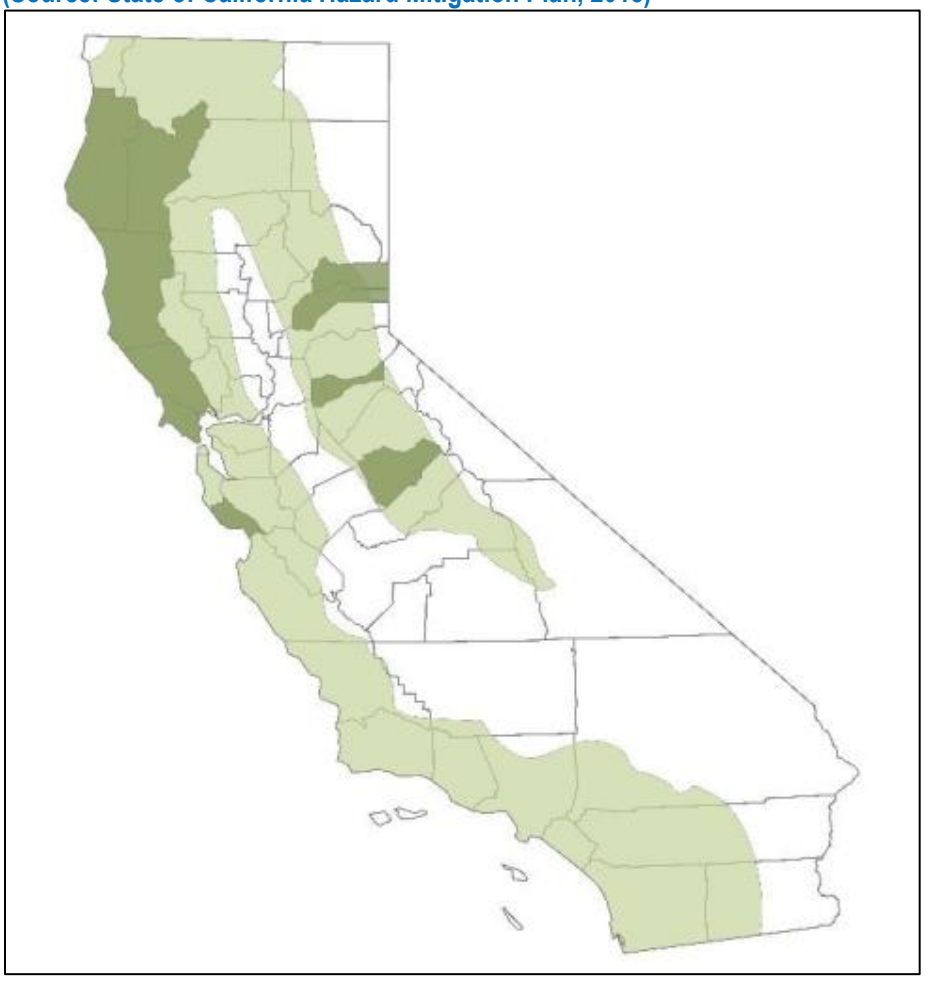


Lyme Disease

Lyme disease is caused by a spirochete (a corkscrew-shaped bacteria) called Borrelia burgdorferi and is transmitted by the Western black-legged tick. Lyme disease was first described in North America in the 1970s in Lyme, Connecticut, the town for which it was then named. Though the tick has been reported from 56 of the 58 counties in California, the highest incidence of disease occurs in the northwest coastal counties and northern Sierra Nevada counties with western-facing slopes. Ticks prefer cool, moist areas and can be found in wild grasses and low vegetation in both urban and rural areas.

The map below shows Western black-legged tick and Lyme disease incidence in California. The Western black-legged tick is commonly found in all green areas shown on the map; dark green areas on the map show where reported Lyme disease cases most often had exposure.

Map: Tick and Lyme Disease Incidence in California
(Source: State of California Hazard Mitigation Plan, 2018)



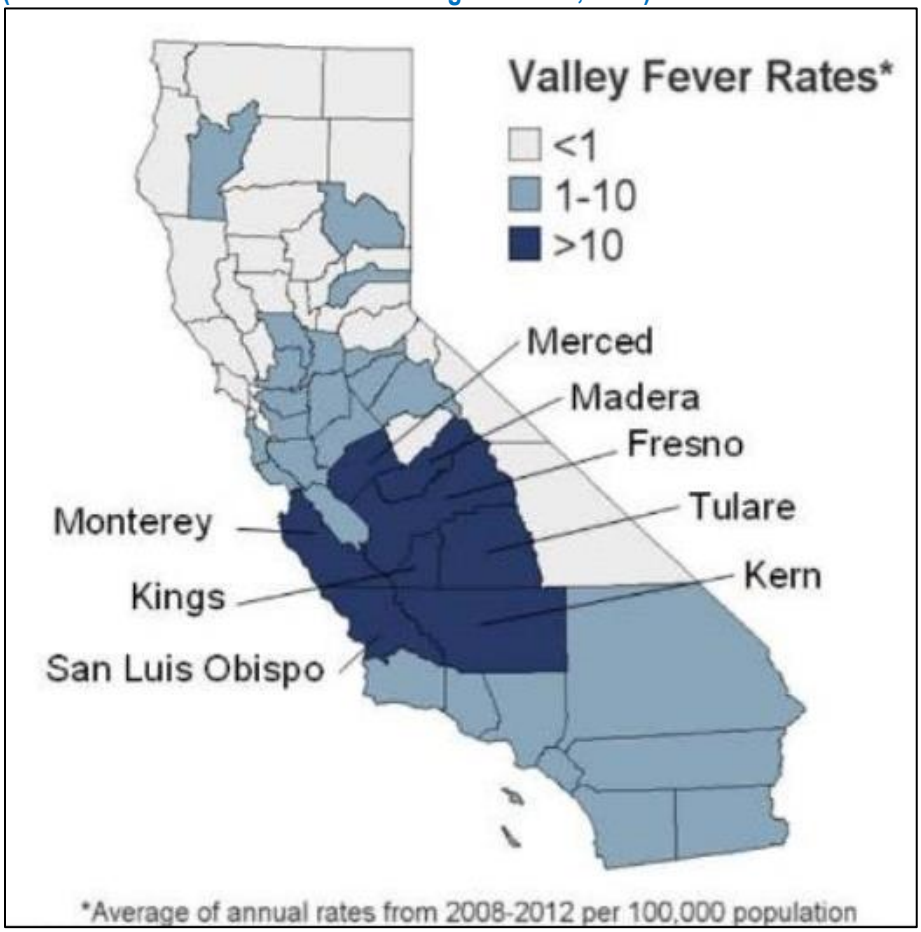
Valley Fever

Valley Fever is caused by Coccidioides, a fungus that lives in the soil in the southwestern United States and parts of Mexico, Central America, and South America. Inhaling the airborne fungal spores can cause an infection called coccidioidomycosis, which is also known as "cocci" or "Valley Fever."

Most people who are exposed to the fungus do not get sick, but some people develop flu-like symptoms that may last for weeks to months. In a very small proportion of people who get Valley Fever, the infection can spread from the lungs to other parts of the body and cause more severe conditions, such as meningitis or even death. Valley Fever cannot spread from person to person.

Most cases of Valley Fever in the U.S. occur in people who live in or have traveled to the southwestern United States, especially Arizona and California. The map below shows the areas where the fungus that causes Valley Fever is thought to be endemic, or native and common in the environment. The full extent of the current endemic areas is unknown and is a subject for further study

Map: Valley Fever Average Annual Rates by California County
(Source: State of California Hazard Mitigation Plan, 2018)



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 Epidemic/Pandemic/Vector-Borne Diseases in the City of San Fernando** below.

Previous Occurrences of Epidemic/Pandemic/Vector-Borne Diseases in the City of San Fernando

The City does not have specific data or records of previous cases. However, because the County of Los Angeles has been affected by outbreaks, it is assumed that the City has also. In the past century, Los Angeles County has been struck by pandemic outbreaks. In 1918 the Spanish Flu, a form of the H1N1 swine flu, killed between 50 and 100 million people worldwide. In the United States, the flu originated simultaneously in the Midwest and New England and rapidly moved across the country, killing thousands on the West Coast. Of greatest concern to urban areas are influenza strains such the avian flu (H5N1) and swine flu (H1N1).

The tables below show previous occurrences of West Nile and Influenza cases affecting the County:

Table: Confirmed West Nile Infections and Fatalities in Los Angeles County by Year (Source: Acute Communicable Disease Control, County of Los Angeles Public Health, 2019)

Year	Infections	Hospitalizations	Deaths
2015	300	262	24
2016	153	131	6
2017	268	224	27
2018	47	37	3
2019	29	24	3

Table: Los Angeles County Influenza Surveillance Summary, 2018-19 Influenza Season (Source: Influenza in Los Angeles County, County of Los Angeles Public Health, 2019)

Influenza Type	2017-2018	2018-2019
Influenza	12,429	6,429
Respiratory Outbreak (Influenza)	43	25
Unknown Respiratory Outbreak	113	21
Deaths	289	125

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

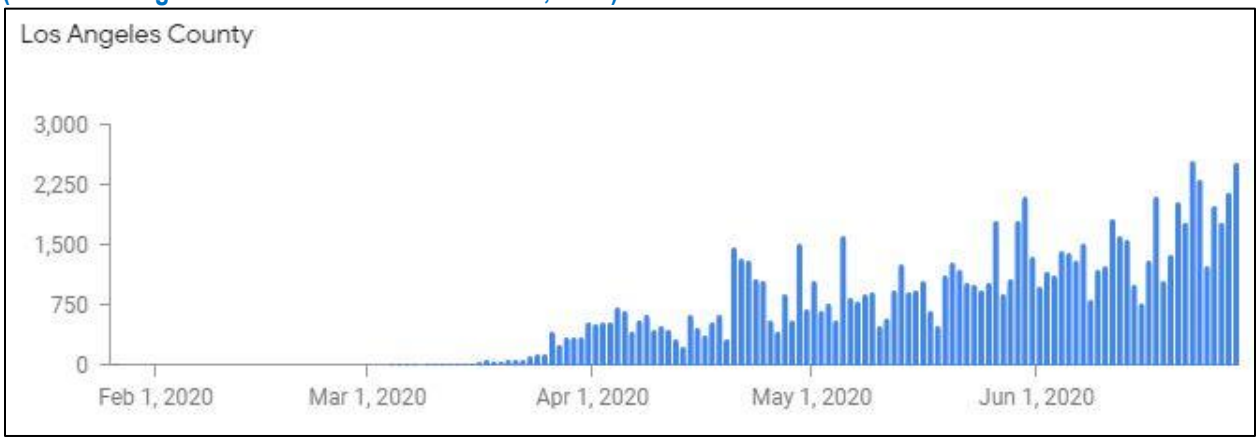
COVID-19

While the variety of influenza, vector borne, and mosquito borne diseases continue to affect the City, COVID-19 currently has the biggest impact. According to the County of Los Angeles Public Health Department, the City of San Fernando has 289 cases and 11 deaths as of June 28, 2020. This virus is spreading at an alarming rate due to the ease of transmission. Therefore, urban communities are especially vulnerable to COVID-19.

Table: Confirmed COVID-19 Cases in Los Angeles County
(Source: Google News and the New York Times, 2020)

Month	Positive Cases
March	339
April	559
May	1,074
June	2,523

Chart: County of Los Angeles New Cases, March-June 2020
(Source: Google News and the New York Times, 2020)



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 Epidemic/Pandemic/Vector-Borne Diseases in the City of San Fernando** below.

Impact of Epidemic/Pandemic/Vector-Borne Diseases in the City of San Fernando

Based on the risk assessment, it is evident that Epidemic/Pandemic/Vector-Borne Diseases will continue to have potentially devastating economic impacts to the City of San Fernando. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Disruption of public infrastructure
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to citizens as facilities, businesses, and public areas could be closed
- ✓ Significant decrease in convenience of shopping
- ✓ Business operations may be closed or limited to essential and critical needs only

PART III: MITIGATION STRATEGIES

Mitigation Strategies

Overview of Mitigation Strategy

As the cost of damage from disasters continues to increase nationwide, the City of San Fernando 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 at the City of San Fernando facilities.

The plan provides a set of action items to reduce risk from hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities.

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 San Fernando
2. Identify and prioritize future mitigation projects
3. Assist in meeting the requirements of federal assistance programs

The Mitigation Plan is integrated with other City plans including the City of San Fernando Emergency Operations Plan, General Plan, Capital Improvement Program, 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.
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.

Goals

In the 2014 Multi-Hazard Mitigation Plan, the Planning Team identified the overall goal to guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. The 2020 Planning Team agreed to maintain the overall goal as well as the five mitigation goals as identified below.

The Planning Team established goals based on the risk assessment that represent a long-term vision for hazard reduction and enhanced mitigation capabilities.

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.

Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic 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.

Public Awareness

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

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

Natural Systems

Balance watershed planning, natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment.

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

Partnerships and Implementation

Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, business, and industry to gain a vested interest in implementation.

Encourage leadership within public and private sector organizations to prioritize and implement local, county, and regional hazard mitigation activities.

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

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.

Q&A | ELEMENT D. MITIGATION STRATEGY | D3
Q: Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))
A: See **Priority Rating** below.

Priority Rating

The Planning Team utilized the following rating tool to establish priorities. Designations of "High", "Medium", and "Low" priority have been assigned to all of the 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)) **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.
Q&A | ELEMENT C. MITIGATION STRATEGY | C6c.
Q: The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. (Requirement §201.6(c)(4)(ii)) **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.

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
Multi-Hazard Action Items														
MH-1	Revitalize the Disaster Council. The Council should be reorganized to include community members. Resume regular meetings.	Police Department												Completed in 2020
MH-2	~~Conduct a Review of Redevelopment Projects in the City~~ ~~Implementation Ideas:~~ • ~~A review of the existing development projects should be made.~~	~~Community Development and Public Works~~	~~Ongoing~~	~~X~~				~~X~~						Deleted

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	~~• A list of the top five projects that lend themselves to mitigation planning should be selected.~~													
MH-3	Conduct Annual Implementation Meetings for the Hazard Mitigation Plan. Review status of each action item on the Mitigation Actions Matrix. Schedule annual review during same timeframe as the City's budget review.	Hazard Mitigation Planning Team	Annual	X				X		IR	H	L	H	Revised
~~MH-4~~	~~Action Item: Provide Annual Training for Staff on Mitigation Planning Implementation Ideas:~~ ~~• Training related to mitigation planning~~	~~City Department Heads~~	~~Ongoing~~	~~X~~				~~X~~						Deleted

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	~~should be provided to staff.~~													
MH-5	In preparation for Public Safety Power Shutoff and other emergency events, inform residents of park shelter locations.	Public Works	1 year	X	X		X			IR	H	L	H	New
MH-6	Inform residents of evacuation routes.	Police	1 year	X	X		X			IR	H	L	H	New
MH-7	Purchase emergency generators for all park shelter locations.	Public Works	1 year	X	X		X			IR	H	L	H	New
MH-8	Emergency Generators – The City currently uses two of its parks as a location where the community can gather for shelter during emergencies and for cooling during extreme heat events (sustained	Public Works	1 year (with funding)	X	X		X	X	Y	ER	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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	temperature readings over 100 degrees). Southern California Edison has also contracted with the City to use one of these parks as a location where the community can gather for charging of equipment (phones, tablets, computers, and medical equipment) during their PSPS events due to extreme wind events. The two parks in question do not currently have back-up generation. In the event of power outages and power shutdowns, the parks could not adequately													

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	provide the ability to operate its HVAC equipment, provide lighting, or charge electronic or medical equipment. The City views this project as critical for the needs of its community during critical weather or fire events. This is considered a multi-hazard action item with respect to windstorm and wildfires. The purchase of two adequately sized, permanent generators units would provide the community with two locations to shelter.													

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
MH-9	Tree Trimming Mitigation – In an effort to reduce risk of downed power lines, damage to life or property of City residents, damage to City infrastructure, the City needs to identify all hazardous or potentially hazardous trees that are excessive in height, have unstable growth (i.e. too heavy/long) of branches/canopy, or appear weak in the tree foundation (i.e. could become uprooted). Funds are limited to manage the trimming and or removal of the many mature trees in the City.	Public Works	This is a program that will take 5-10 years to complete using general fund. Mitigation funding could help reduce this to less than 5 years	X	X	X		X	Y	IR, ER	H	M	H	New, Funding Note: The City has general fund money that it uses for tree trimming by grids with some funds remaining for emergency response. External funds would be necessary to address the urgent nature of the issue with our abundant mature trees.

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	Many trees in the city have grown up and surrounded power lines. The urgency on a program to reduce weight on trees, pull them significantly back from power lines, and remove trees that are dangerously unstable at the base, is at a critical point for community safety.													
Earthquake Action Items														
EQ-1	Qualify Staff to Conduct Post-Earthquake Building Safety Inspections. Using rapid visual screening to quickly inspect a building and identify disaster damage or potential	Public Works												Completed - Public Works Director took SAP Course through Cal OES in summer of 2020

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	seismic structural and non-structural weaknesses to prioritize retrofit efforts, inventory high-risk structures and critical facilities, or assess post-disaster risk to determine if buildings are safe to re-occupy.													
EQ-2	Develop an outreach program about earthquake risk and mitigation activities in homes and businesses.	Community Development	Ongoing	X	X		X		Y	IR	H	L	H	Revised
	Educate homeowners and business owners on safety techniques to follow during and after an earthquake.	Community Development	Ongoing	X	X		X		Y	IR	H	L	H	Revised
	Share availability of Cal MyHazards which provides	Community Development	Ongoing	X	X		X		Y	IR	H	L	H	Revised

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	individuals with free online hazard mapping.													
~~EQ-3~~	~~Conduct Outreach to Builders, Architects, Engineers, and Inspectors Implementation Ideas:~~ ~~• Building susceptibility to earthquake damage can be improved if design professionals are made aware of proper design and building requirements.~~ ~~• Outreach activities include: Conducting information sessions or other forms of outreach would include providing~~	~~Building and Safety Department and Disaster Council~~	~~2-5 years~~	~~X~~										Deleted

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	~~information on seismic code provisions for new and existing buildings to enhance code use and enforcement.~~ • ~~Training building department staff and officials on Form ATC-20 for post-earthquake building evaluation. The ATC-20 report and addendum, prepared by the Applied Technology Council, provide procedures and guidelines for making on-the-spot evaluations and~~													

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	~~decisions regarding the seismic fitness of structures.~~													
EQ-4	Provide Information on Structural and Non-Structural Retrofitting. Property owners can retrofit existing structures to reduce damage from seismic events.	Community Development	Ongoing	X	X		X	X	Y	IR	H	L	H	Revised
EQ-5	Educating homeowners about structural and non-structural retrofitting of vulnerable homes and encouraging retrofit.	Community Development	Ongoing	X	X		X	X	Y	IR	H	L	H	Revised
EQ-6	Developing an outreach program to encourage homeowners to secure furnishings, storage cabinets, and utilities to	Community Development	Ongoing	X	X		X	X	Y	IR	H	L	H	Revised

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	prevent injuries and damage. Examples include anchoring tall bookcases and file cabinets, installing latches on drawers and cabinet doors, restraining desktop computers and appliances, using flexible connections on gas and water lines, mounting framed pictures and mirrors securely, and anchoring and bracing propane tanks and gas cylinders.													
EQ-7	Seek Funding for Structural Engineer to Conduct Seismic Inventory Audit of City-owned Facilities.	Public Works	1 year	X	X		X		Y	ER	H	H	H	New
EQ-8	Seek Funding to Retrofit City-owned Facilities	Public Works	1-5 years	X	X		X		Y	ER	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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	Based on Results of Seismic Inventory.													
Flood Action Items														
FLD-1	Encouraging homeowners and business owners to purchase flood insurance; annually distributing flood protection safety pamphlets or brochures to the owners of flood-prone property.	Public Works	Ongoing	X	X	X	X		Y	IR	H	L	H	Revised
FLD-2	Educate citizens about safety during flood conditions, including the dangers of driving on flooded roads.	Public Works	Ongoing	X	X	X	X		Y	IR	H	L	H	Revised
FLD-3	Use outreach programs to advise homeowners of risks to life, health, and safety.	Public Works	Ongoing	X	X	X	X		Y	IR	H	L	H	Revised

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
FLD-4	Develop Policies to Reduce Stormwater Runoff.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised
FLD-5	Design a natural runoff or zero discharge policy for stormwater in subdivision design.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised
FLD-6	Require more trees be preserved and planted in landscape designs to reduce the amount of stormwater runoff.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised
FLD-7	Encourage the use of porous pavement, vegetative buffers, and islands in large parking areas.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised
FLD-8	Conforming pavement to land contours so as not to provide easier avenues for stormwater.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
FLD-9	Encourage the use of permeable driveways and surfaces to reduce runoff and increase groundwater recharge.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised
FLD-10	Adopted LA County Low-Impact Design Manual which applies to stormwater management issues for new development.	Public Works	Ongoing	X	X	X	X	X	Y	IR	H	L	H	New, Completed in 2017
FLD-11	Regional Infiltration Project – The City is currently completing design for a project that will divert much of the stormwater that collects in the city to an infiltration basin that will help recharge the groundwater aquifer that	Public Works	2-3 years	X	X	X			X	ER	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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	supplies water to the City of San Fernando and Los Angeles. In addition to the water usage and storage benefits, reduced risk of flooding for the City and the broader region is also accomplished by this project The project is currently funded through a combination of outside State and County grant sources. The City does have a local match requirement and hazard mitigation funding could help the City meet this goal on the project.													

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
FLD-12	Pacoima wash projects – The City is currently working on two separate projects that will address safety with respect to community protection during heavy rain and flash flooding that can occur in the Pacoima Wash that cuts through a portion of the City. Both projects include protective fencing – one over a bridge that traverses the Wash and the other that will separate a planned bike and walking path along the Wash. The project is currently funded through a	Public Works	2-3 years	X	X	X		X	Y	ER	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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	combination of outside State and County grant sources. The City does have a local match requirement and hazard mitigation funding could help the City meet this goal on the project. The Pacoima Wash was the site of a tragic loss for the Community. In 2017, the life a boy was lost when he tried to cross the Wash during a flash-flood event. The measures of adding protective fencing will prevent tragedies like this from occurring again in the future.													

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
Wildfire Action Items														
WF-1	Share Wildfire Vulnerability Maps.	Public Works, LA City Fire	Ongoing	X	X	X	X	X	Y	IR	H	L	H	Revised
WF-2	Protect Water Storage Facility Near Interstate 210. Protective measures could include defensible space, automatic sprinklers, etc.	Public Works, LA City Fire,	Ongoing	X	X	X	X	X	Y	IR	H	L	H	New
WF-3	Work with LA City Fire Department to identify transient living environments posing fire hazard threat to community.	Police, Public Works, LA City Fire	Ongoing	X	X	X	X	X	Y	IR	H	L	H	New
WF-4	Share information with citizens on defensible space and other fire mitigation techniques.	Public Works, LA City Fire	Ongoing	X	X	X	X	X	Y	IR	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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
Windstorm Action Items														
WND-1	Educating homeowners on the benefits of wind retrofits such as shutters, hurricane clips, etc.	Public Works	Ongoing	X	X		X		Y	IR	H	L	H	Revised
~~WND-2~~	~~Assess Vulnerability to Severe Winds~~ ~~Implementation Ideas:~~ • ~~Developing and maintaining a database to track community vulnerability to severe wind.~~ • ~~Creating a severe wind scenario to estimate potential loss of life and injuries, the types of potential damage, and existing~~	~~Public Works~~	~~2 years~~	~~X~~										Deleted

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	~~vulnerabilities within San Fernando to develop severe wind mitigation priorities.~~													
WND-3	Based on existing inventory of City-owned trees, eliminate vulnerable and dead trees.	Public Works	1-5 years	X	X	X	X			ER	H	H	H	New
WND-4	Proactive tree trimming in advance of major storms. Encourage homeowners and business owners to do the same.	Public Works	1 year	X	X	X	X			IR	H	L	H	New
Human Caused Action Items														
~~HC-1~~	~~Action Item: Coordinate law enforcement planning with the other member cities of Mutual Aid Area C.~~ ~~Implementation Ideas:~~	~~Police Department~~	~~1-2 years~~	~~X~~						~~IR~~				Deleted the hazard category

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 and Planning Mechanism:** IR – Internal Resources, ER – External Resources	**Benefit:** L-Low, M-Medium, H-High	**Cost:** L-Low, M-Medium, H-High	**Priority:** L-Low, M-Medium, H-High	**2020 Comments and Status –** C-Completed, R-Revised, D-Deleted, N-New, P- Postponed, and Notes
	• ~~Coordination of emergency planning with Mutual Aid Area C.~~													
Epidemic/Pandemic/Vector-Borne Action Items														
EPV-1	COVID - Enforced Public Health Orders	City Manager	As Necessary	X	X		X	X	Y	IR	H	L	H	New
EPV-2	COVID - Utilized CDBG Funding for Purchase of PPE and Social Distancing Stickers	City Manager	Completed	X	X		X	X	Y	IR	H	L	H	New, Completed 2020
EPV-3	West Nile Virus – Conduct Community Outreach	Public Works	As Necessary	X	X		X	X	Y	IR	H	L	H	New

Plan Maintenance

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

Local Mitigation Officer

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 Planning Team Chair Kenneth Jones who will be referred to as the 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 the City of San Fernando 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 no less than quarterly. 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. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the quarterly meetings.

Method and Scheduling of Plan Implementation

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring	XXXX	XXXX	XXXX	XXXX	XXXX
Evaluating					
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 of San Fernando 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, the City of San Fernando will gain eligibility for Hazard Mitigation Grant Program funds.

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.

Monitoring the Plan

The Local Mitigation Officer will hold quarterly meetings with representatives from the coordinating agencies (as identified in the Mitigation Actions Matrix) in order to gather status updates on the mitigation action items. 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 Multi-Hazard Mitigation Plan. The focus of the quarterly meeting will be on the progress and changes to the Mitigation Action Items.

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.
Q&A | ELEMENT C. MITIGATION STRATEGY | C6b.
Q: Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms? (Requirement §201.6(c)(4)(ii)) **A:** See **Implementation through Existing Programs** below.
Q&A | ELEMENT C. MITIGATION STRATEGY | C6c.
Q: The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. (Requirement §201.6(c)(4)(ii)) **A:** See **Implementation through Existing Programs** below.

Implementation through Existing Programs

The City of San Fernando addresses statewide planning goals and legislative requirements through the General Fund, Capital Projects, and Grants. 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 San Fernando will implement recommended mitigation action items through existing programs and procedures.

The City of San Fernando is responsible for adhering to the State of California's Building and Safety Codes. In addition, the City of San Fernando may work with other agencies at the state level to review, develop and ensure Building and Safety Codes are adequate to mitigate or present 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 strategic and other budget documents. The various departments involved in developing the Plan will review it on an annual basis. Upon annual review, the Planning Team will work with the departments to identify areas that the Mitigation Plan action items are consistent with the strategic and budget documents to ensure the Mitigation Plan goals and action items are implemented in a timely fashion.

Upon FEMA approval, the Planning Team will begin the process of incorporating risk information and mitigation action items into existing planning mechanisms including the General Fund (Operating Budget and Capital Projects - see Mitigation Actions Matrix for links between individual action items and associated planning mechanism). The quarterly 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 the City of San Fernando's planning documents and procedures.

Specifically, the Planning Team will utilize the updates of the following documents to implement the Mitigation Plan:

- ✓ Risk Assessment, City Profile, Planning Process (stakeholders) – Emergency Operations Plan, Climate Action Plan, etc.
- ✓ Mitigation Actions Matrix – General Fund, Capital Projects, Grants

Quarterly Implementation Report

The Quarterly Implementation Matrix is the same as the Mitigation Actions Matrix but with a column added to track the quarterly status of each Action Item. Upon approval and adoption of the Plan, the Quarterly Implementation Reports will be added to the Plan's **Attachments**. Following is a view of the Quarterly Implementation Matrix:

Insert here

An equal 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 to goal achievement and public participation.

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.

Evaluating and Updating the Plan

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 **Evaluation** below.

Evaluation

At the conclusion of the Fourth Quarter Implementation Meeting, the Local Mitigation Officer will lead a discussion with the Planning Team on the success (or failure) of the Mitigation Plan to meet the plan goals. The results of that discussion will be added to the Evaluation portion of the Quarterly Implementation Report and inclusion in the 5-year update to the Plan. Efforts will be made immediately by the Local Mitigation Officer to address any failed plan goals.

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 **Formal Update Process** below.

Formal Update Process

As identified above, the Mitigation Action Items will be monitored for status on an annual basis as well as an evaluation of the Plan's goals. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the annual meeting which will take place annually during the month of the Plan's approval. 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 begin the update process with a review the goals and mitigation action items to determine their relevance to changing situations within the City of San Fernando 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 San Fernando is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be made available at the City of San

Fernando City Hall and on the City's website. The existence and location of these copies will be publicized in the City's Newsletters and on the website. This site will also contain an email address and phone number where people can direct their comments and concerns. At the discretion of the Local Mitigation Officer, a public meeting may be held after the Annual Implementation Meeting. The meeting would provide the public a forum in which interested individuals and/or agencies could express their concerns, opinions, or ideas about the plan.

The Local Mitigation Officer will be responsible for using the City of San Fernando resources to publicize any public meetings and always free to maintain public involvement through the public access channel, web page, and newspapers.

Attachments

FEMA Letter of Approval

City Council Adoption Resolution

Staff Report to City Council

Secondary Stakeholders Involvement

Date Invited to Provide Input or Input Gathered	Agency Represented, Name, Position Title	Information Received

External agencies listed above were invited via email and provided with an electronic link to the City of San Fernando website. Following is the email distributed along with the invitation to contribute to the planning process:

External Agencies Email Invite

Planning Team Minutes: Meeting #1 – July 15, 2020

Minutes

City of San Fernando

Planning Team Meeting #1 (Virtual)

July 15, 2020

Attendance:
Carolyn Harshman, Emergency Planning Consultants

Matthew Baumgardner, City of San Fernando Public Works Department

Kenneth Jones, City of San Fernando Public Works Department

Irwin Rosenberg, City of San Fernando Police Department

1. **Examined the purpose of hazard mitigation.**

2. **Discussed the concepts and terms related to hazard mitigation planning.**

3. **Reviewed the project schedule and public involvement.**

Planning Team Minutes: Meeting #2 – July 23, 2020

Minutes

City of San Fernando

Planning Team Meeting #2 (Virtual)

July 23, 2020

Attendance:
Carolyn Harshman, Emergency Planning Consultants

Matthew Baumgardner, City of San Fernando Public Works Department

Kenneth Jones, City of San Fernando Public Works Department

Irwin Rosenberg, City of San Fernando Police Department

1. **Gathered updated community profile data**
    a. **History, geography, land use, demographics**
2. **Updated risk assessment**
    a. **Team used Calculated Priority Risk Index to rank hazards**
    b. **Vulnerability: Location, Extent, and Probability**
        i. **Gathered historical information about previous significant occurrences**
    c. **Hazards Maps**
        i. **Reviewed HAZUS maps**
    d. **Assess Vulnerability of Facilities to Hazards**
        i. **EPC will assess vulnerability of critical and essential facilities (owned by the City) using the General Plan maps and other internet resources.**

Planning Team Minutes: Meeting #3 – July 30, 2020

City of San Fernando

Minutes

Planning Team Meeting #3 (Virtual)

July 30, 2020

Attendance:

Carolyn Harshman, Emergency Planning Consultants

Matthew Baumgardner, City of San Fernando Public Works Department

Kenneth Jones, City of San Fernando Public Works Department

Irwin Rosenberg, City of San Fernando Police Department

I. **Updated status of the items in the Mitigation Action Matrix identified in the Hazard Mitigation Plan**
    a. **Continued to gather information from the Team members concerning the:**
        1. **Status of Mitigation Action Item: Completed, Deleted, Revised, Ongoing, New, Deferred**
        2. **Ratings: Priority, Benefit, Cost**
        3. **Funding Source and Planning Mechanism**
        4. **Impact to Buildings/Infrastructure**
        5. **Coordinating Agency**
        6. **Timeline**
        7. **Plan Goals accomplished**

II. **Committee prepared new mitigation action items including ongoing action items (since old HMP) and future action items. Shared Action Item samples from County of Los Angeles All-Hazards Mitigation Plan.**
    a. **Used Mitigation Action Item form to track:**
        1. **Action Items, Ideas for Implementation, Coordinating Organization, Timeline, Funding Source, Goals Accomplished, Rankings**

Planning Team Minutes: Meeting #4 – September 3, 2020

City of San Fernando

Minutes

Planning Team Meeting #4 (Virtual)

September 5, 2020

Attendance:
Carolyn Harshman, Emergency Planning Consultants

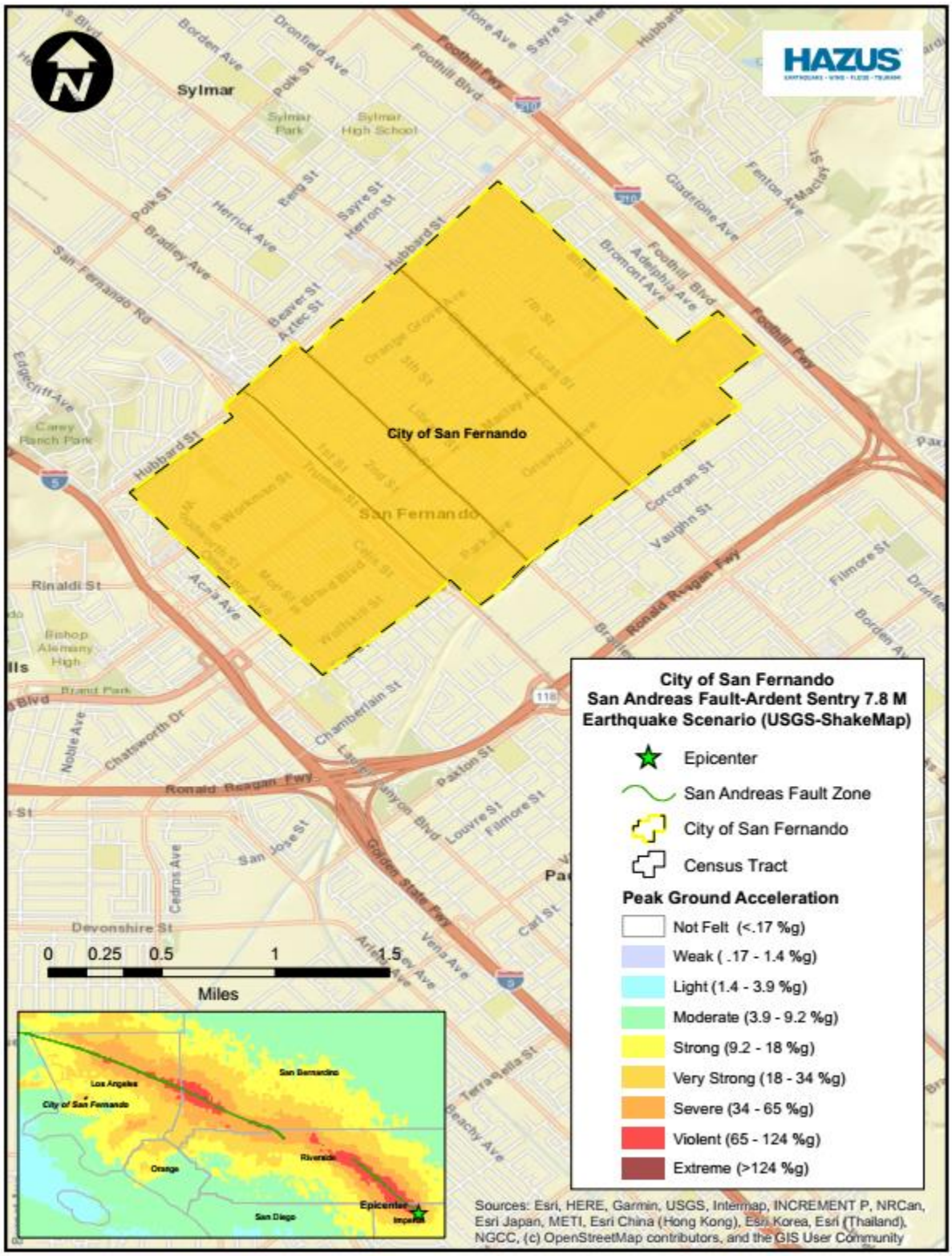
Matthew Baumgardner, City of San Fernando Public Works Department

Kenneth Jones, City of San Fernando Public Works Department

Irwin Rosenberg, City of San Fernando Police Department

I. **First Draft Plan was distributed in advance to the members of the Planning Team.**
    a. **Plan overview provided.**
    b. **Gaps identified and questions answered.**
    c. **Discussed strategy for plan review, adoption, approval**
        ii. **Order of gathering input to the Draft Plan**
            1. **Planning Team members**
            2. **General Public and External Agencies**
                a. **Public (notice of plan availability)**
                b. **External Agencies: Servicing Special Districts and Adjoining Jurisdictions**

HAZUS – San Andreas M7.8



HAZUS

FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: SanFernando_EQ_FLD

Earthquake Scenario: M7.8-Ardent Sentry 2015 Scenario v1

Print Date: June 04, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

HAZUS

FEMA

Table of Contents

HAZUS

FEMA

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region which has a total population of 23,645 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 2,228 (millions of dollars). Approximately 88.00 % of the buildings (and 64.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 886 and 13 (millions of dollars), respectively.

HAZUS

FEMA

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 6 thousand buildings in the region which have an aggregate total replacement value of 2,228 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 88% of the building inventory. The remaining percentage is distributed between the other general building types.

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.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 17 schools, 0 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 2 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 899.00 (millions of dollars). This inventory includes over 60.27 miles of highways, 2 bridges, 118.68 miles of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	2	3.0314
	Segments	129	819.4411
	Tunnels	0	0.0000
	Subtotal		822.4725
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	8	23.9706
	Tunnels	0	0.0000
	Subtotal		23.9706
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	2	40.1726
	Tunnels	0	0.0000
	Subtotal		40.1726
Bus	Facilities	0	0.0000
	Subtotal		0.0000
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	0	0.0000
	Subtotal		0.0000
Airport	Facilities	0	0.0000
	Runways	0	0.0000
	Subtotal		0.0000
	Total		886.60

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.2535
	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		2.2535
Waste Water	Distribution Lines	NA	1.3521
	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		1.3521
Natural Gas	Distribution Lines	NA	0.9014
	Facilities	0	0.0000
	Pipelines	1	8.9674
	Subtotal		9.8688
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		0.0000
Electrical Power	Facilities	0	0.0000
	Subtotal		0.0000
Communication	Facilities	0	0.0000
	Subtotal		0.0000
	Total		13.50

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Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	M7.8-Ardent Sentry 2015 Scenario v1
Type of Earthquake	
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	0.00
Latitude of Epicenter	0.00
Earthquake Magnitude	7.80
Depth (km)	0.00
Rupture Length (Km)	0.00
Rupture Orientation (degrees)	0.00
Attenuation Function	

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Direct Earthquake Damage

Building Damage

Hazus estimates that about 156 buildings will be at least moderately damaged. This is over 3.00 % of the buildings in the region. There are an estimated 6 buildings that will be damaged beyond repair. The definition of the "damage states" is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

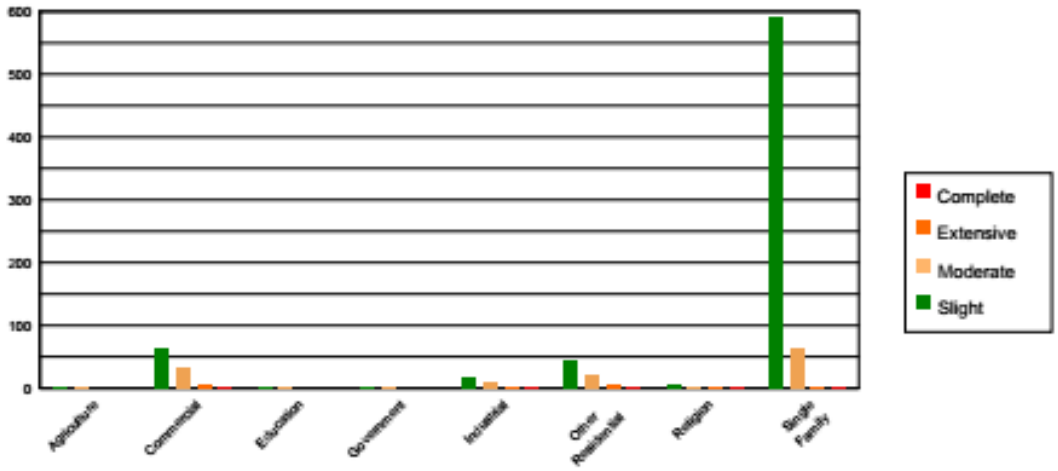

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4.76	0.09	0.72	0.10	0.34	0.26	0.12	0.63	0.06	0.97
Commercial	388.22	7.48	62.03	8.58	31.80	24.45	7.14	36.15	1.81	27.31
Education	11.68	0.23	1.56	0.22	0.61	0.47	0.12	0.61	0.03	0.41
Government	7.81	0.15	1.22	0.17	0.72	0.55	0.20	1.01	0.05	0.80
Industrial	97.71	1.88	17.40	2.41	10.98	8.44	3.54	17.95	1.37	20.67
Other Residential	234.29	4.52	43.46	6.01	19.52	15.01	6.18	31.27	2.57	38.71
Religion	40.82	0.79	6.05	0.84	2.94	2.26	0.90	4.54	0.30	4.50
Single Family	4402.30	84.86	590.56	81.68	63.15	48.56	1.55	7.84	0.44	6.63
Total	5,188		723		130		20		7	

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Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	4615.39	88.97	625.50	86.52	67.91	52.22	1.54	7.81	0.48	7.30
Steel	99.47	1.92	19.34	2.67	14.55	11.19	6.50	32.91	3.24	48.85
Concrete	101.48	1.96	17.03	2.36	8.53	6.56	1.92	9.74	0.18	2.68
Precast	108.47	2.09	17.86	2.47	11.10	8.54	1.96	9.95	0.10	1.58
RM	180.19	3.47	17.07	2.36	9.61	7.39	1.52	7.70	0.03	0.43
URM	29.40	0.57	6.17	0.85	3.00	2.31	0.57	2.89	0.09	1.32
MH	53.17	1.02	20.03	2.77	15.35	11.80	5.73	29.01	2.51	37.84
Total	5,188		723		130		20		7	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	17	0	0	17
EOCs	1	0	0	1
PoliceStations	1	0	0	1
FireStations	0	0	0	0

Transportation Lifeline Damage

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	129	0	0	128	128
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
Railways	Segments	8	0	0	1	1
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	2	0	0	1	1
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	70	114	29
Waste Water	42	57	14
Natural Gas	7	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	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	5,967	512	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

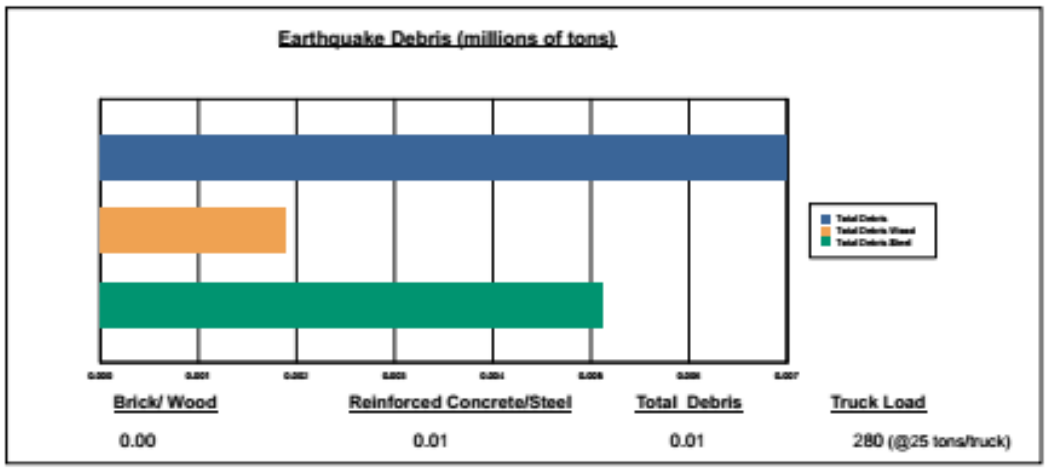
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 27.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 280 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

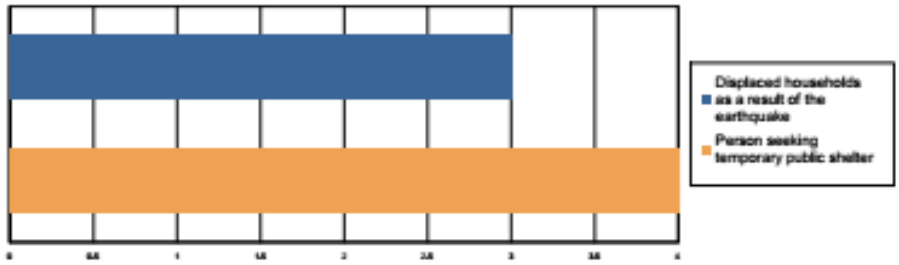


Social Impact

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 3 households to be displaced due to the earthquake. Of these, 4 people (out of a total population of 23,645) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
3	4

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.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.10	0.02	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.38	0.09	0.01	0.02
	Other-Residential	1.17	0.19	0.01	0.02
	Single Family	1.90	0.11	0.00	0.00
	Total	4	0	0	0
2 PM	Commercial	6.04	1.21	0.15	0.30
	Commuting	0.00	0.01	0.01	0.00
	Educational	3.98	0.90	0.12	0.24
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.78	0.63	0.09	0.17
	Other-Residential	0.23	0.04	0.00	0.00
	Single Family	0.38	0.02	0.00	0.00
	Total	13	3	0	1
5 PM	Commercial	4.41	0.88	0.11	0.22
	Commuting	0.03	0.13	0.10	0.03
	Educational	0.40	0.09	0.01	0.02
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.74	0.40	0.05	0.10
	Other-Residential	0.42	0.07	0.00	0.01
	Single Family	0.70	0.04	0.00	0.00
	Total	8	2	0	0

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Economic Loss

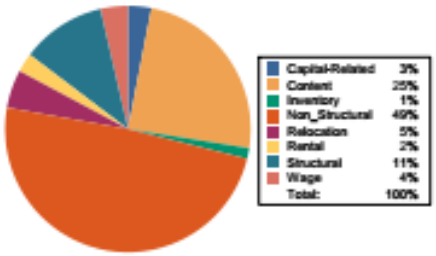
The total economic loss estimated for the earthquake is 48.30 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The 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.

The total building-related losses were 47.41 (millions of dollars); 14 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 32 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

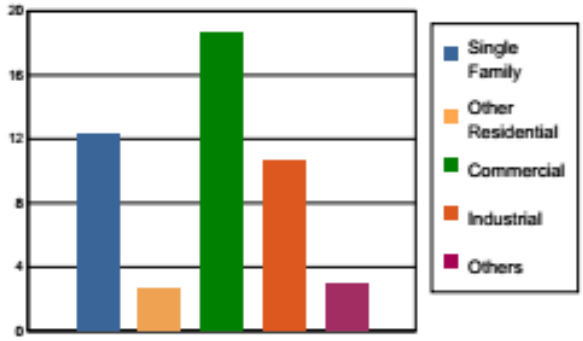


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0012	1.5163	0.1366	0.0835	1.7376
	Capital-Related	0.0000	0.0005	1.3209	0.0834	0.0172	1.4220
	Rental	0.1350	0.0781	0.8063	0.0702	0.0480	1.1376
	Relocation	0.4022	0.0988	1.1910	0.3701	0.2976	2.3597
	Subtotal	**0.5372**	**0.1786**	**4.8345**	**0.6603**	**0.4463**	**6.6569**
Capital Stock Losses							
	Structural	1.1679	0.2620	2.1795	1.2771	0.3536	5.2401
	Non_Structural	7.7223	1.7760	7.4475	4.9448	1.3857	23.2763
	Content	2.9198	0.4991	4.1268	3.3983	0.7162	11.6602
	Inventory	0.0000	0.0000	0.1367	0.4339	0.0020	0.5726
	Subtotal	**11.8100**	**2.5371**	**13.8905**	**10.0541**	**2.4575**	**40.7492**
	Total	**12.35**	**2.72**	**18.73**	**10.71**	**2.90**	**47.41**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	819.4411	0.0000	0.00
	Bridges	3.0314	0.0373	1.23
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**822.4725**	**0.0373**	
Railways	Segments	23.9706	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**23.9706**	**0.0000**	
Light Rail	Segments	40.1726	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**40.1726**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**886.62**	**0.04**	

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Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.2535	0.5135	22.79
	Subtotal	2.2535	0.5135	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.3521	0.2579	19.07
	Subtotal	1.3521	0.2579	
Natural Gas	Pipelines	8.9674	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	0.9014	0.0884	9.81
	Subtotal	9.8688	0.0884	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
	Total	13.47	0.86	

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Appendix A: County Listing for the Region

Los Angeles,CA

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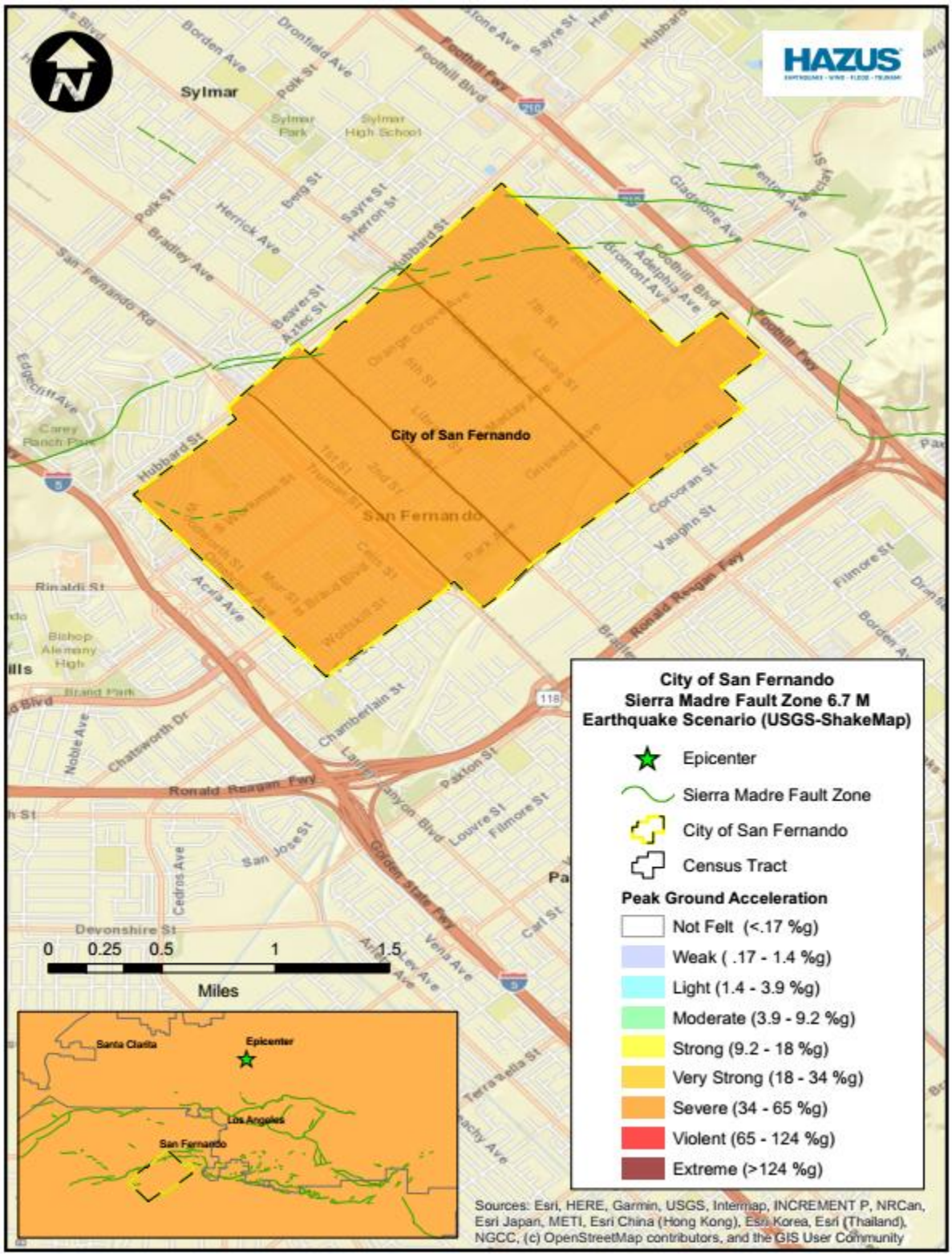
Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California	Los Angeles	23,645	1,437	791	2,228
Total Region		23,645	1,437	791	2,228

HAZUS Map – Sierra Madre M6.7



Hazus: Earthquake Global Risk Report

Region Name: SanFernando_EQ_FLD

Earthquake Scenario: M6.7-Sierra Madre (San Fernando) v11

Print Date: June 05, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Table of Contents

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2.37 square miles and contains 4 census tracts. There are over 5 thousand households in the region which has a total population of 23,645 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 6 thousand buildings in the region with a total building replacement value (excluding contents) of 2,228 (millions of dollars). Approximately 88.00 % of the buildings (and 64.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 886 and 13 (millions of dollars) , respectively.

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Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 6 thousand buildings in the region which have an aggregate total replacement value of 2,228 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 88% of the building inventory. The remaining percentage is distributed between the other general building types.

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.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 17 schools, 0 fire stations, 1 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 2 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 899.00 (millions of dollars). This inventory includes over 60.27 miles of highways, 2 bridges, 118.68 miles of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	2	3.0314
	Segments	129	819.4411
	Tunnels	0	0.0000
	Subtotal		**822.4725**
Railways	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	8	23.9706
	Tunnels	0	0.0000
	Subtotal		**23.9706**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	2	40.1726
	Tunnels	0	0.0000
	Subtotal		**40.1726**
Bus	Facilities	0	0.0000
	Subtotal		**0.0000**
Ferry	Facilities	0	0.0000
	Subtotal		**0.0000**
Port	Facilities	0	0.0000
	Subtotal		**0.0000**
Airport	Facilities	0	0.0000
	Runways	0	0.0000
	Subtotal		**0.0000**
	Total		**886.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	2.2535
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	2.2535
Waste Water	Distribution Lines	NA	1.3521
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	1.3521
Natural Gas	Distribution Lines	NA	0.9014
	Facilities	0	0.0000
	Pipelines	1	8.9674
		Subtotal	9.8688
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	0	0.0000
		Subtotal	0.0000
Communication	Facilities	0	0.0000
		Subtotal	0.0000
		Total	13.50

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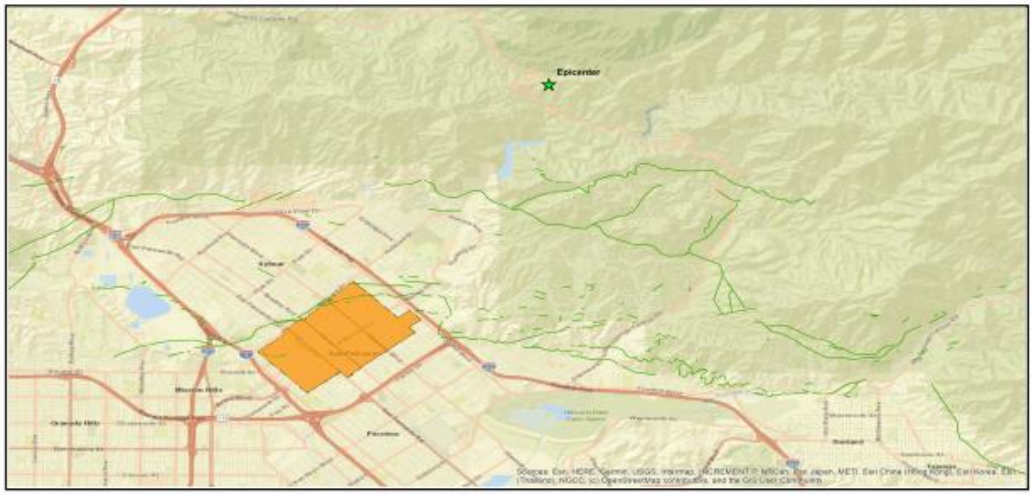
Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	M6.7-Sierra Madre (San Fernando) v11
Type of Earthquake	
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	0.00
Latitude of Epicenter	0.00
Earthquake Magnitude	6.71
Depth (km)	0.00
Rupture Length (Km)	0.00
Rupture Orientation (degrees)	0.00
Attenuation Function	

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Direct Earthquake Damage

Building Damage

Hazus estimates that about 2,167 buildings will be at least moderately damaged. This is over 36.00 % of the buildings in the region. There are an estimated 142 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

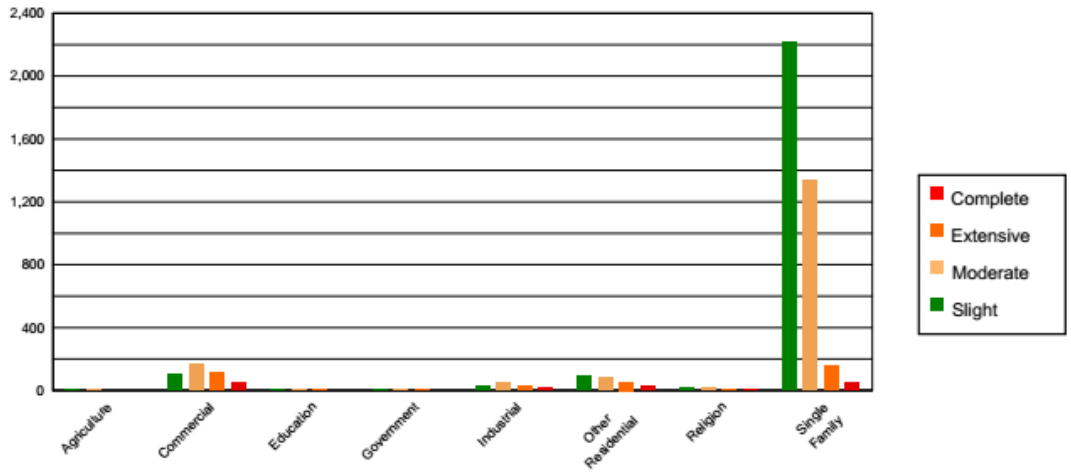

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1.05	0.07	1.64	0.07	1.86	0.11	0.97	0.26	0.49	0.34
Commercial	62.78	4.33	102.88	4.20	167.30	10.11	109.95	29.64	48.10	33.84
Education	2.81	0.19	3.99	0.16	4.33	0.26	2.12	0.57	0.75	0.53
Government	1.40	0.10	2.11	0.09	3.21	0.19	2.25	0.61	1.03	0.72
Industrial	14.20	0.98	24.62	1.01	45.24	2.74	31.87	8.59	15.08	10.61
Other Residential	51.58	3.55	88.13	3.60	84.43	5.10	54.07	14.57	27.80	19.55
Religion	8.21	0.57	12.56	0.51	15.98	0.97	9.93	2.68	4.31	3.04
Single Family	1309.37	90.21	2212.36	90.36	1331.82	80.51	159.85	43.09	44.61	31.38
Total	**1,451**		**2,448**		**1,654**		**371**		**142**	

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Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1368.28	94.27	2321.96	94.84	1403.53	84.85	168.05	45.30	49.01	34.48
Steel	14.26	0.98	22.29	0.91	50.57	3.06	38.79	10.46	17.19	12.09
Concrete	17.22	1.19	30.17	1.23	40.73	2.46	28.45	7.67	12.57	8.85
Precast	12.47	0.86	23.16	0.95	50.35	3.04	36.98	9.97	16.54	11.63
RM	35.97	2.48	38.88	1.59	68.99	4.17	49.39	13.31	15.18	10.68
URM	2.13	0.15	5.25	0.21	12.07	0.73	10.33	2.78	9.44	6.64
MH	1.06	0.07	6.56	0.27	27.93	1.69	39.01	10.51	22.21	15.63
Total	**1,451**		**2,448**		**1,654**		**371**		**142**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	17	17	0	0
EOCs	1	1	0	0
PoliceStations	1	1	0	0
FireStations	0	0	0	0

Transportation Lifeline Damage

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	129	0	0	128	128
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
Railways	Segments	8	0	0	1	1
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	2	0	0	1	1
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	70	69	17
Waste Water	42	35	9
Natural Gas	7	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	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	5,967	0	0	0	0	0
Electric Power		4,149	2,454	937	168	6

Induced Earthquake Damage

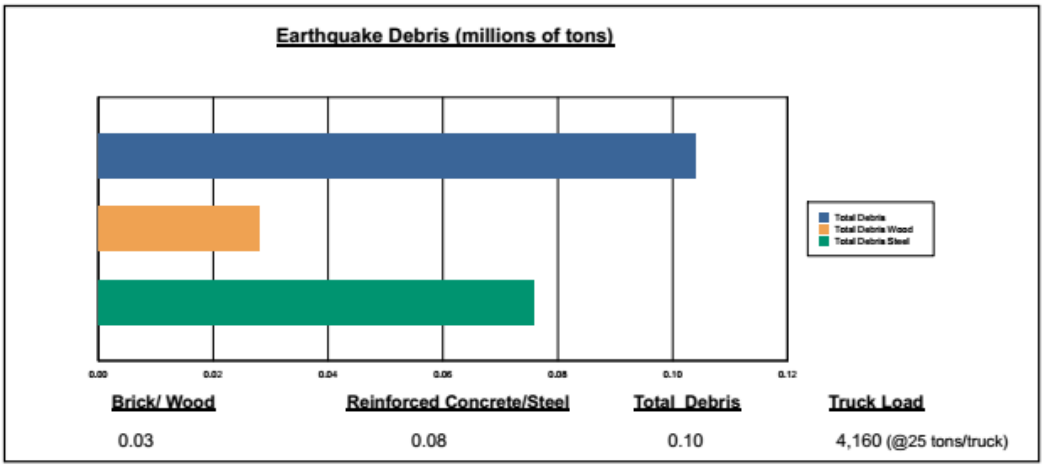
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 1 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 104,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 27.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 4,160 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



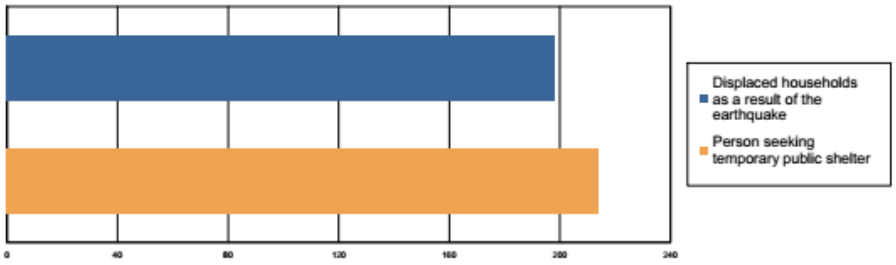
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.03	0.08	0.10	4,160 (@25 tons/truck)

Social Impact

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 198 households to be displaced due to the earthquake. Of these, 214 people (out of a total population of 23,645) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
198	214

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.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.83	0.52	0.08	0.17
	Commuting	0.00	0.01	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.22	1.20	0.19	0.38
	Other-Residential	17.58	4.28	0.53	1.02
	Single Family	34.09	5.17	0.27	0.46
	Total	**58**	**11**	**1**	**2**
2 PM	Commercial	108.57	30.86	5.05	9.93
	Commuting	0.01	0.05	0.04	0.01
	Educational	45.10	12.50	2.03	3.98
	Hotels	0.00	0.00	0.00	0.00
	Industrial	31.08	8.80	1.42	2.77
	Other-Residential	3.48	0.85	0.11	0.20
	Single Family	7.21	1.10	0.07	0.10
	Total	**195**	**54**	**9**	**17**
5 PM	Commercial	79.59	22.55	3.70	7.18
	Commuting	0.17	0.85	0.68	0.17
	Educational	4.44	1.23	0.20	0.39
	Hotels	0.00	0.00	0.00	0.00
	Industrial	19.43	5.50	0.89	1.73
	Other-Residential	6.68	1.63	0.21	0.39
	Single Family	13.25	2.03	0.12	0.18
	Total	**124**	**34**	**6**	**10**

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Economic Loss

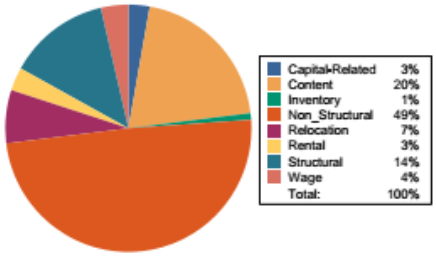
The total economic loss estimated for the earthquake is 454.04 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The 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.

The total building-related losses were 453.34 (millions of dollars); 16 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 38 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

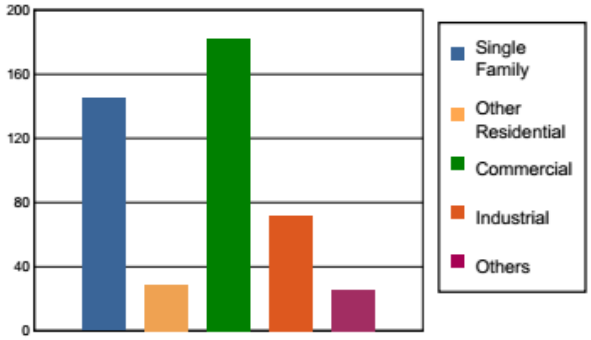


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0283	14.3379	0.9233	0.7303	16.0198
	Capital-Related	0.0000	0.0121	11.6964	0.5577	0.1604	12.4266
	Rental	3.0846	1.3902	8.4025	0.4661	0.4673	13.8107
	Relocation	11.2618	1.2545	12.9215	2.4265	3.0368	30.9011
	Subtotal	**14.3464**	**2.6851**	**47.3583**	**4.3736**	**4.3948**	**73.1582**
Capital Stock Losses							
	Structural	17.6468	3.2144	27.4007	9.4167	3.6470	61.3256
	Non_Structural	86.5884	18.5878	72.7464	32.8101	12.2124	222.9451
	Content	26.3404	4.3799	33.4340	22.5069	5.3959	92.0571
	Inventory	0.0000	0.0000	1.1456	2.6916	0.0129	3.8501
	Subtotal	**130.5756**	**26.1821**	**134.7267**	**67.4253**	**21.2682**	**380.1779**
	Total	**144.92**	**28.87**	**182.09**	**71.80**	**25.66**	**453.34**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	819.4411	0.0000	0.00
	Bridges	3.0314	0.1795	5.92
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**822.4725**	**0.1795**	
Railways	Segments	23.9706	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**23.9706**	**0.0000**	
Light Rail	Segments	40.1726	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**40.1726**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**886.62**	**0.18**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	2.2535	0.3119	13.84
	Subtotal	**2.2535**	**0.3119**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	1.3521	0.1567	11.59
	Subtotal	**1.3521**	**0.1567**	
Natural Gas	Pipelines	8.9674	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	0.9014	0.0537	5.96
	Subtotal	**9.8688**	**0.0537**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**13.47**	**0.52**	

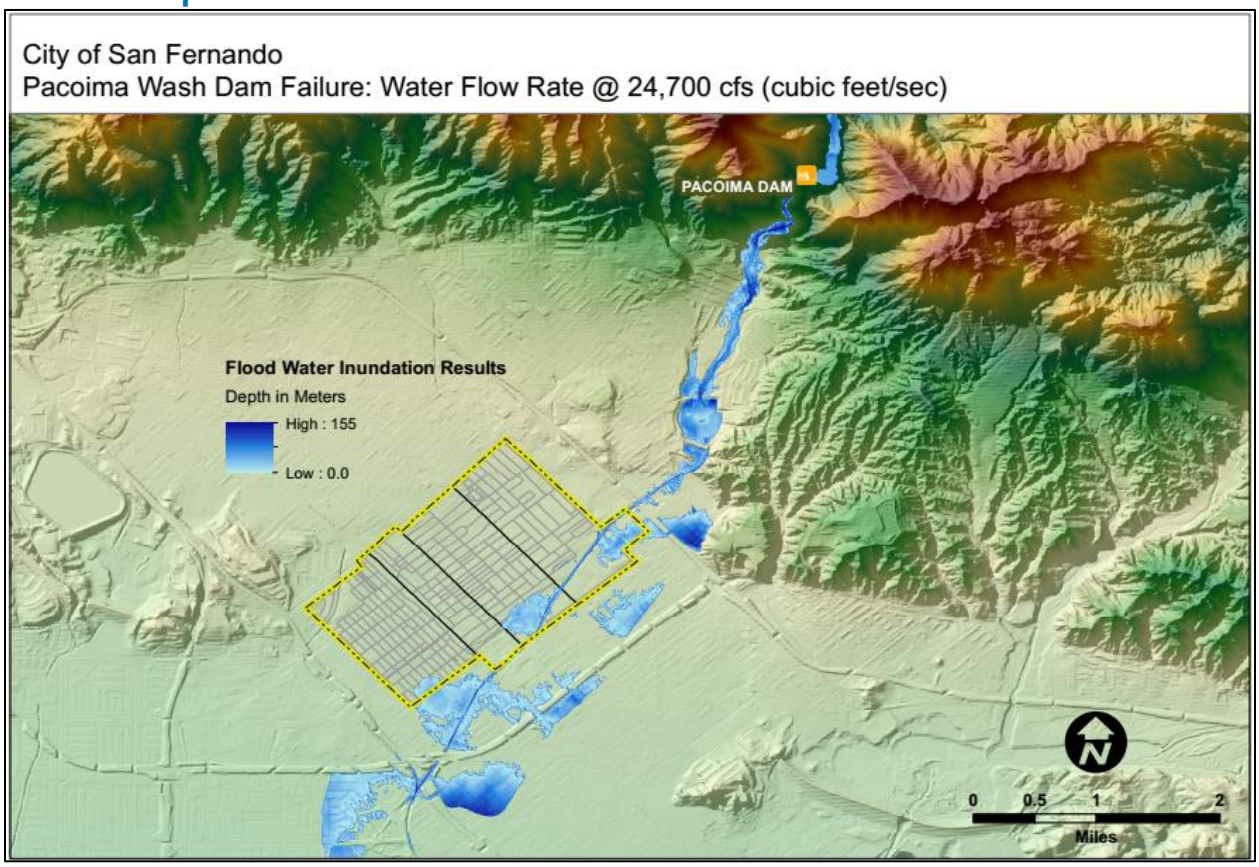
Appendix A: County Listing for the Region

Los Angeles,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Los Angeles	23,645	1,437	791	2,228
Total Region		**23,645**	**1,437**	**791**	**2,228**

HAZUS Map – Pacoima Dam



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Hazus: Flood Global Risk Report

Region Name:	SanFernando_EQ_FLD
Flood Scenario:	24,700
Print Date:	Monday, June 1, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included county(ies) from the following state(s):

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2 square miles and contains 309 census blocks. The region contains over 6 thousand households and has a total population of 23,645 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 6,067 buildings in the region with a total building replacement value (excluding contents) of 2,229 million dollars. Approximately 88.41% of the buildings (and 64.50% of the building value) are associated with residential housing.

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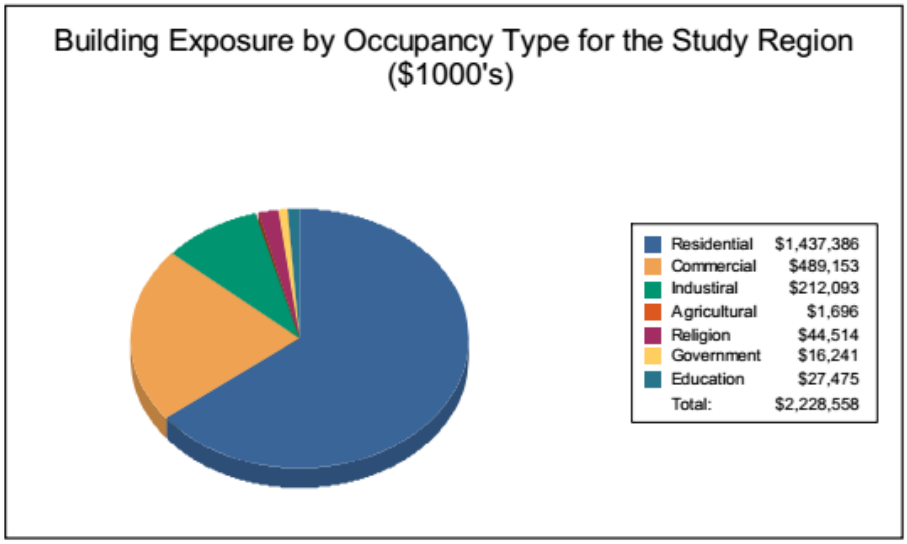
Building Inventory

General Building Stock

Hazus estimates that there are 6,067 buildings in the region which have an aggregate total replacement value of 2,229 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,437,386	64.5%
Commercial	489,153	21.9%
Industrial	212,093	9.5%
Agricultural	1,696	0.1%
Religion	44,514	2.0%
Government	16,241	0.7%
Education	27,475	1.2%
Total	**2,228,558**	**100%**



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Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 17 schools, no fire stations, 1 police station and 1 emergency operation center.

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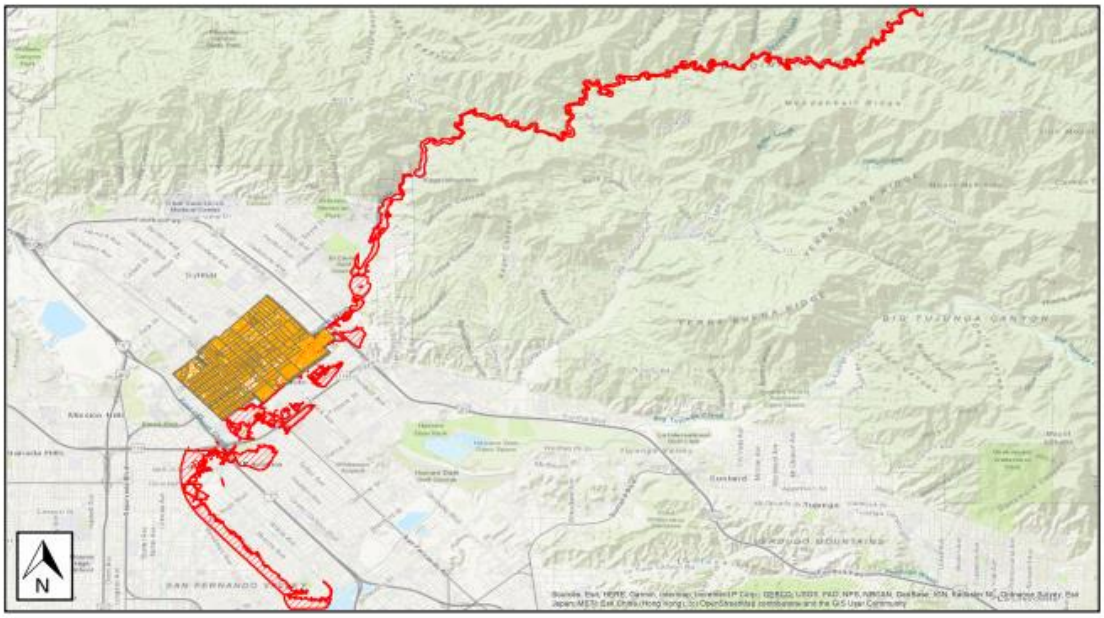
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



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Building Damage

General Building Stock Damage

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Essential Facility Damage

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Induced Flood Damage

Debris Generation

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Social Impact

Shelter Requirements

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Economic Loss

Building-Related Losses

The 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 flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

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Appendix A: County Listing for the Region

California
- Los Angeles

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Appendix B: Regional Population and Building Value Data

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