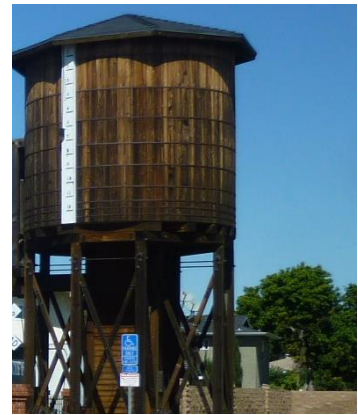


Final Plan

December 18, 2018 | Hazard Mitigation Plan



Credits

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A: See **Special Thanks** below.

Special Thanks

Hazard Mitigation Planning Team:

Agency	Name	Department	Position
City of Lomita	Michael Sansbury	Parks	Field Operations Manager
	Laura Vander Neut, Planning Team Chair	City Manager's Office	Management Analyst, Emergency Services Coordinator
	Mark Andersen	Public Works	Field Operations Manager
	Susan Kamada	Finance	Administrative Services Director
	Alicia Velasco	Community Development	Principal Planner
Los Angeles County Sheriff's Department	John Despot	Sheriff's Department	Deputy
Los Angeles County Fire Department	Laura Walters	Fire Department	Community Services Liaison
Disaster Management Area Coordinator	Jeff Robinson	Area G	Coordinator
Emergency Planning Consultants	Carolyn J. Harshman	Consultant	President

Acknowledgements

City of Lomita City Council

- ✓ James Gazeley, Mayor
- ✓ Mark Waronek, Mayor Pro Tem
- ✓ Henry Sanchez, Jr., Council Member
- ✓ Michael G. Savidan, Council Member
- ✓ Ben Traina, Council Member



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Mapping

The maps in this plan were provided by the City of Lomita, 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 Lomita 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:

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q A1: Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A:



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Part I: PLANNING PROCESS

Introduction

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City's comprehensive land use planning and emergency management planning programs. This document is a federally mandated update to the City of Lomita 2004 Hazard Mitigation Plan and ensures continuing eligibility for Hazard Mitigation Grant Program (HMGP) funding.

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

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

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

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

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

Planning Approach

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

- ✓ **Develop mitigation goals and objectives** - The risk assessment (hazard characteristics, inventory, and findings), along with municipal policy documents, were utilized to develop mitigation goals and objectives.
- ✓ **Identify and prioritize mitigation actions** - Based on the risk assessment, goals and objectives, existing literature/resources, and input from participating entities, mitigation activities were identified for each hazard. Activities were 1) qualitatively evaluated



against the goals and objectives, and other criteria; 2) identified as high, medium, or low priority; and 3) presented in a series of hazard-specific tables.

- ✓ **Prepare implementation strategy** - Generally, high priority activities are recommended for implementation first. However, based on community needs and goals, project costs, and available funding, some medium or low priority activities may be implemented before some high priority items.
- ✓ **Document mitigation planning process** - The mitigation planning process is documented throughout this plan.

Hazard Land Use Policy in California

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

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

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

State and Federal Partners in Hazard Mitigation

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

Some of the key agencies include:

- ✓ California Office of Emergency Services (Cal OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- ✓ Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.
- ✓ California Department of Forestry and Fire Protection (CAL FIRE) is responsible for all aspects of wildland fire protection on private and state properties, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- ✓ California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, and the development of partnerships aimed at reducing risk.
- ✓ California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists



in emergency management. It also educates the public, serves local water needs by providing technical assistance

- ✓ FEMA provides hazard mitigation guidance, resource materials, and educational materials to support implementation of the capitalized DMA 2000.
- ✓ United States Census Bureau (USCB) provides demographic data on the populations affected by natural disasters.
- ✓ United States Department of Agriculture (USDA) provides data on matters pertaining to land management.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

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

Stakeholders

A Hazard Mitigation Planning Team (Planning Team) consisting of department representatives from City of Lomita, County of Los Angeles, and Disaster Management Area Coordinators staff worked with Emergency Planning Consultants to create the updated Plan. **The Planning Team served as the primary stakeholders throughout the planning process.**

As required by DMA 2000, the Planning Team informed the general public and external agencies (including special districts and adjoining jurisdictions) of the planning process and provided opportunities for input during the plan writing phase. **The general public and external agencies served as secondary stakeholders in the planning process.**

Hazard Mitigation Legislation

Hazard Mitigation Grant Program

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

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

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

- ✓ Property acquisition and relocation projects
- ✓ Structural retrofitting to minimize damages from earthquake, flood, high wind, wildfire, or other natural hazards
- ✓ Elevation of flood-prone structures



- ✓ Vegetative management programs, such as:
- ✓ Brush control and maintenance
- ✓ Fuel break lines in shrubbery
- ✓ Fire-resistant vegetation in potential wildland fire areas

Pre-Disaster Mitigation Program

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

The federal budget typically includes two types of grants (planning and competitive) under the PDM Program. Planning grants allocate funds to each state for Mitigation Plan development. Competitive grants distribute funds to states, local governments, and federally recognized Indian tribal governments via a competitive application process. FEMA reviews and ranks the submittals based on pre-determined criteria. The minimum eligibility requirements for competitive grants include participation in good standing in the National Flood Insurance Program (NFIP) and a FEMA-approved Mitigation Plan. (Source: <http://www.fema.gov/fima/pdm.shtm>)

Flood Mitigation Assistance Program

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

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

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

**Craig Fugate,
FEMA Director**

Q&A | ELEMENT C. MITIGATION STRATEGY | C2

Q: C2. 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 **National Flood Insurance Program** 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 Lomita adopted a floodplain management ordinance and has Flood Insurance Rate Maps (FIRM) that show floodways, 100-year flood zones, and 500-year flood zones. Los Angeles County Public Works Department is designated as floodplain administrator.

NFIP Participation

The City of Lomita participates in NFIP. Unfortunately, FEMA flood maps are not entirely accurate. These studies and maps represent flood risk at the point in time when FEMA completed the studies and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities. The FEMA FIRM maps for the City of Lomita were last updated September 26, 2008. The FEMA FIRM maps above represent the current status of the FIRM maps. Human-caused and natural changes to the environment have changed the dynamics of storm water run-off since then.

Special Flood Hazards Areas (SFHA) are areas at or below a flood elevation that has a one percent or greater probability of being equaled or exceeded during any given year (this is also known as a 100-year flood event). This flood, which is referred to as the base flood, is the national standard on which the floodplain management and insurance requirements of the NFIP are based. All of Lomita is in Zone X and therefore not vulnerable to 100-year or 500-year flood events.

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

Q: B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

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

Repetitive Loss Properties

Repetitive Loss Properties (RLPs) are most susceptible to flood damages; therefore, they have been the focus of flood hazard mitigation programs. Unlike a Countywide program, the Floodplain Management Plan (FMP) for repetitive loss properties involves highly diversified property profiles, drainage issues, and property owner's interest. It also requires public involvement processes unique to each RLP area. The objective of an FMP is to provide specific potential mitigation measures and activities to best address the problems and needs of communities with repetitive loss properties. A repetitive loss property is one for which two or more claims of \$1,000 or more have been paid by the National Flood Insurance Program (NFIP)



within any given ten-year period. According to FEMA resources, there are no Repetitive Loss Properties (RLPs) within the City of Lomita.

State and Federal Guidance in Hazard Mitigation

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

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

- ✓ DMA 2000 (Public Law 106-390, October 10, 2000)
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, October 1, 2002
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, February 26, 2002
- ✓ How-To Guide for Using HAZUS-MH for Risk Assessment, (FEMA 433), February 2004
- ✓ Mitigation Planning "How-to" Series (FEMA 386-1 through 9 available at: <http://www.fema.gov/fima/planhowto.shtm>)
- ✓ Getting Started: Building Support For Mitigation Planning (FEMA 386-1)
- ✓ Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 386-2)
- ✓ Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
- ✓ Bringing the Plan to Life: Implementing the Mitigation Plan (FEMA 386-4)
- ✓ Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)
- ✓ Integrating Historic Property and Cultural Resource Considerations into Mitigation Planning (FEMA 386-6)
- ✓ Integrating Manmade Hazards Into Mitigation Planning (FEMA 386-7)
- ✓ Multi-Jurisdictional Mitigation Planning (FEMA 386-8)
- ✓ Using the Mitigation Plan to Prepare Successful Mitigation Projects (FEMA 386-9)
- ✓ State and Local Plan Interim Criteria Under the DMA 2000, July 11, 2002, FEMA
- ✓ Mitigation Planning Workshop For Local Governments-Instructor Guide, July 2002, FEMA
- ✓ Report on Costs and Benefits of Natural Hazard Mitigation, Document #294, FEMA
- ✓ LHMP Development Guide – Appendix A - Resource, Document, and Tool List for Local Mitigation Planning, December 2, 2003, Cal OES
- ✓ Local Mitigation Plan Review Guide (FEMA 2011)
- ✓ Local Mitigation Planning Handbook (FEMA 2013)

How is the Plan Organized?

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



Following is a description of each section of the plan:

Part I: Planning Process

Introduction

Describes the background and purpose of developing a mitigation plan.

Planning Process

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

Part II: Risk Assessment

Community Profile

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

Risk Assessment

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

City-Specific Hazard Analysis

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

Earthquake | Localized Flooding | Windstorm | Drought

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

Part III: Mitigation Strategies

Mitigation Strategies

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

Plan Maintenance

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

Part IV: Appendix

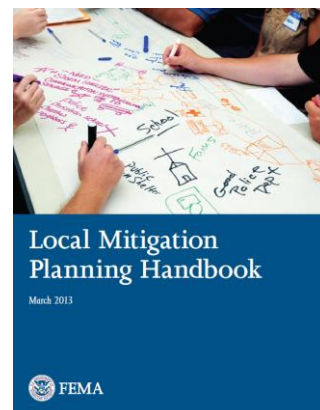
The plan appendices are designed to provide users of the Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

General Hazard Overviews

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

Attachments

FEMA Letter of Approval
City Council Staff Report





City Council Resolution
Planning Team sign-in sheets
General public web postings and notices
References
Listing of Maps, Tables, and Figures

Plan Adoption and Approval

As per DMA 2000 and supporting Federal regulations, the Mitigation Plan is required to be adopted by the City Council and approved by FEMA.

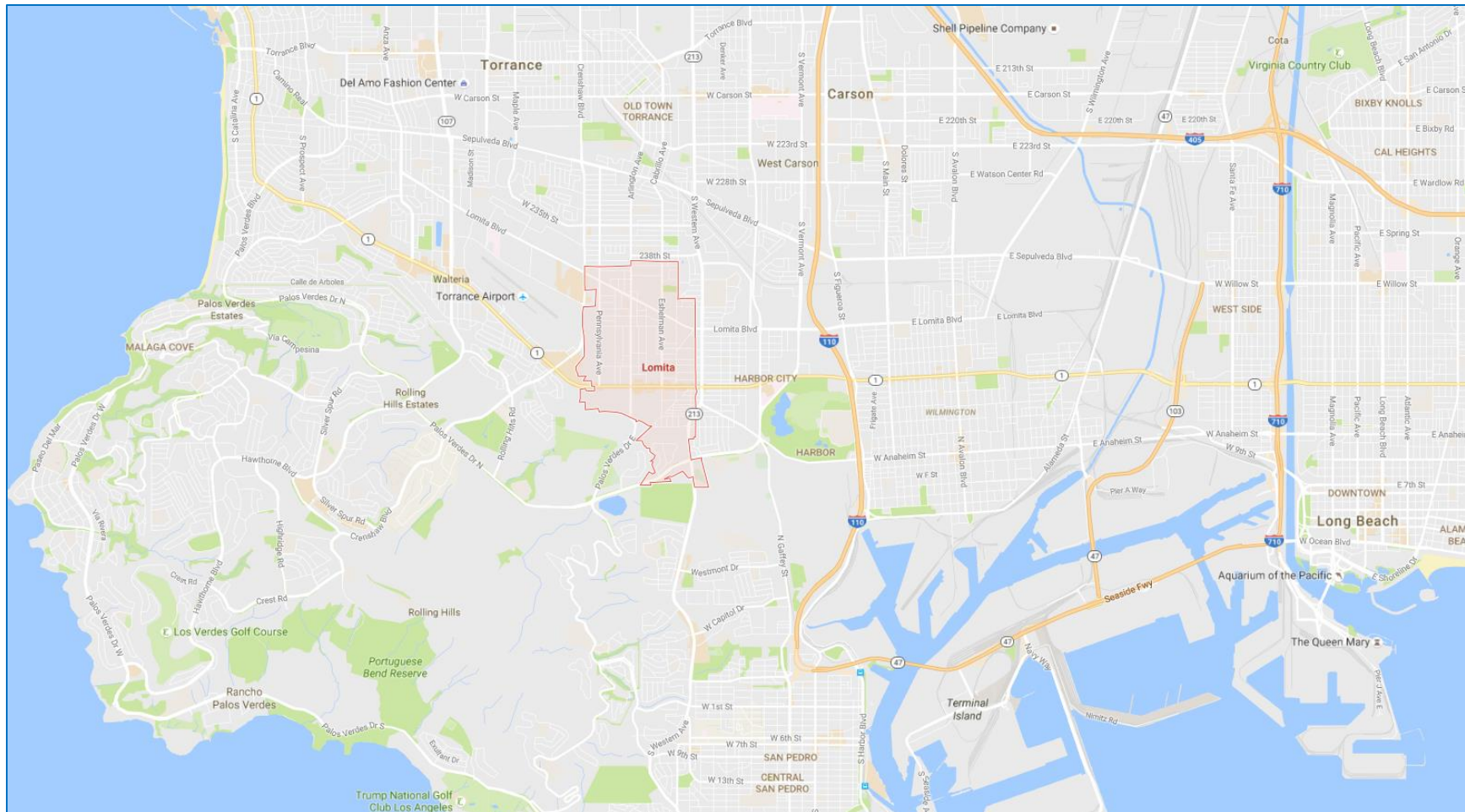
While the Second Draft was still being used to gather input from the general public and external agencies, the Planning Team provided the City Council with a courtesy copy of the Plan along with a briefing on the formal process of Plan approval and adoption. On the consent agenda, the City Council approved submission of the Plan to Cal OES and FEMA for review and conditional approval. Following receipt of the conditional approval, the City Council meeting was scheduled, official notices posted as per jurisdictional protocol, staff report prepared, and item heard. See the **Planning Process Section** for details.

Who Does the Mitigation Plan Affect?

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



Map: City of Lomita
(Source: Google Maps)





Planning Process

Throughout the project, the City followed its traditional approach to developing policy documents which included preparation of a First Draft Plan for review by the City's Hazard Mitigation Planning Team who served as the primary stakeholders. Next, following amendments to reflect the input of the Planning Team, a Second Draft Plan was shared with the secondary stakeholders – the general public and external agencies (special districts and adjoining jurisdictions) during the plan writing phase. Simultaneously, the City Council was also provided a “courtesy copy” (Second Draft Plan) and informed that the plan writing phase was still underway and input from the general public and external agencies was still underway. Upon the closing date, a Third Draft Plan would include all input gathered and the Plan would be forwarded to Cal OES and FEMA along with a request for a conditional approval. On the consent agenda, the City Council approved submission of the Third Draft Plan to Cal OES and FEMA with the understanding that it would be coming back to them for adoption.

Next, the Planning Team completed amendments to the Plan to reflect mandated input by Cal OES and FEMA. The Fourth Draft Plan was then posted as per jurisdictional protocols, including hard copy postings, website postings, and notification to the stakeholder external agencies. Comments gathered in advance of the City Council meeting were incorporated into a City Council Staff Report. Following adoption by the City Council, the Final Draft Plan was re-submitted to FEMA with a request for final approval. The planning process described above is portrayed below in a timeline:

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

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

Q&A | ELEMENT A: PLANNING PROCESS | A2

Q: A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))

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

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

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

Q&A | ELEMENT E: PLAN ADOPTION | E1

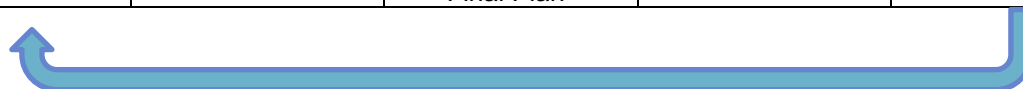
Q: E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

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



Figure: Planning Phases Timeline

PLANNING PHASES TIMELINE				
Plan Writing Phase (First & Second Draft Plan)	Plan Review Phase (Third Draft Plan)	Plan Adoption Phase (Fourth Draft Plan)	Plan Approval Phase (Final Plan)	Plan Implementation Phase
<ul style="list-style-type: none"> Planning Team input – research, meetings, writing, review of First Draft Plan Incorporate input from the Planning Team into Second Draft Plan Invite public and external agencies to provide input to the Second Draft Plan. Present Second Draft to City Council to authorize distribution to Cal OES and FEMA Incorporate input into the Third Draft Plan 	<ul style="list-style-type: none"> Third Draft Plan submitted to Cal OES and FEMA for approval pending adoption Address any mandated revisions identified by Cal OES and FEMA 	<ul style="list-style-type: none"> Schedule Fourth Draft Plan for City Council adoption. Post meeting notice and plan including invitation to external agencies. Incorporate input gathered during posting period into the City Council staff report. Fourth Draft Plan distributed to City Council in advance of meeting Present Fourth Draft Plan to the City Council for adoption Incorporate input from City Council public meeting into Final Plan 	<ul style="list-style-type: none"> Submit proof of City Council adoption to FEMA with request for final approval Receive FEMA approval Incorporate FEMA approval into the Final Plan 	<ul style="list-style-type: none"> Conduct quarterly Planning Team meetings Integrate mitigation action items into budget, CIP and other funding and strategic documents





Plan Methodology

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

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

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

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

Q&A | ELEMENT A: PLANNING PROCESS | A2

Q: A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **Planning Team Involvement** below.

Planning Team Involvement

The Planning Team consisted of representatives from City of Lomita departments related to hazard mitigation processes. The Chair of the Planning Team (see Credits) communicated with Department Heads about the pending update to the Mitigation Plan and requested names of department representatives. Then the Chair sent an email to department representatives describing the nature of the Mitigation Plan and the need for their participation and attendance at three Planning Team meetings. The Team served as the primary stakeholders throughout the planning process. Citizens and businesses (“general public”) along with external agencies served as secondary stakeholders in the planning process. The Planning Team was responsible for the following tasks:

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



The Planning Team, with support from other City staff and local organizations, 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. Specifically, following is a breakdown of the meetings and topics covered. Agendas are located in the **Attachments**:

	Meeting #1 April 28, 2016	Meeting #2 May 28, 2016	Meeting #3 July 21, 2016
Hazard Identification and Ranking	X		
Update and Development New Mitigation Action Items		X	
Review First Draft Plan			X

Table: Planning Team Level of Participation

Name	Research and Writing of Plan	Planning Team Meeting 4/28/2016	Planning Team Meeting 5/28/2016	Planning Team Meeting 7/21/2016	Planning Team Input on First Draft Plan	Invitation for Input from general public, and external agencies of the Second Draft Plan	Submit Second Draft Plan to City Council on consent agenda as an informational item prior to submission to Cal OES/FEMA	Submit Third Draft Plan to Cal OES/FEMA	Present Fourth Draft Plan to City Council at Public Meeting for Plan Adoption	Submit Proof of Adoption to FEMA	Publish Final Plan incorporating FEMA final approval
Laura Vander Neut, Planning Team Chair	X	X	X	X	X	X	X	X	X	X	X
Michael Sansbury		X	X		X						
Mark Andersen		X	X	X	X						
Susan Kamada		X	X	X	X						
Alicia Velasco		X	X		X						
John Despot		X	X		X						
Laura Walters		X	X	X	X						
Jeff Robinson		X	X	X	X						



Table: Planning Team Timeline

	March 2016	April	May	June	July	August	September	October	November	December	January 2017	February-July						
Research and Writing of First Draft Plan	X	X	X	X	X													
Planning Team Meetings		X	X		X													
Planning Team Input on First Draft Plan					X													
Invitation for Input by general public and external agencies of the Second Draft Plan						X												
Submit Second Draft Plan to City Council as information item to forward to Cal OES/FEMA						X												
Incorporate input from public, external agencies, and City Council into Third Draft Plan										X								
Third Draft Plan into Cal OES/FEMA for Review and Approval Pending Adoption										X	X	X						



	March 2016	April	May	June	July	August	September	October	November	December	January 2017	February-July						
Receive Approval Pending Adoption from FEMA																		
Submit Fourth Draft Plan to City Council																		
Forward Proof of Council Adoption to FEMA																		
FEMA Issues Approval																		
Publish Final Plan																		



Q&A | ELEMENT A: PLANNING PROCESS | A2

Q: A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **General Public and External Agency Involvement** below.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **General Public and External Agency Involvement** below.

General Public and External Agency Involvement

The Planning Team provided data, expertise, and other input during plan writing phase. This effort was supplemented through the assistance of the general public and external agencies (special districts and adjoining jurisdictions). The City posted a public notice (agenda) announcing the availability of the Second Draft Plan on its website and other customary posting locations (e.g. City Hall). Copies of the postings are located in the **Appendix**. The postings directed the general public to the City's website where the Second Draft Plan was available for download along with a request to submit input directly to the Chair of the Planning Team.

External agencies were invited via email (see **Attachments**) and provided an electronic link to the City's website.

No feedback was received from the general public however one external agency did provide input as shown below. The comments and how the comments were handled were incorporated into the Third Draft Plan prior to submission to Cal OES and FEMA:

Table: General Public and External Agency Involvement

Agency	Name	Job Title	Email	Comments and Resolution
General Public				None
External Agencies				
City of El Segundo	Chris Donovan	Fire Chief	CDonovan@ElSegundo.org	None
City of Gardena	Vince Osorio	Police Lieutenant	vosorio@gardenapd.org	None
City of Hawthorne	Dennis Hernandez	Risk Manager	dhernandez@cityofhawthorne.org	None
City of Hermosa Beach	Erin Concas	Emergency Management Coordinator	econcas@hermosabch.org	None
City of Inglewood	Claudio Taniguchi	Emergency Preparedness Coordinator	ctaniguchi@cityofinglewood.org	None



City of Lawndale	Jaime Guerrero	Emergency Preparedness Coordinator	jguerrero@lawndalecity.org	<p>Comment 1: The U.S. Census has provided new American Community Survey data with a 2014 date that may provide the most current social, economic, housing, and demographic characteristics of your city. Here is the link I found. https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2014/</p> <p>Resolution 1: Planning Team opted to keep the Housing Element as the “source”.</p> <p>Comment 2: Would recommend indicating where Lomita is located on the fault map on page 41.</p> <p>Resolution 2: Revised map</p> <p>Comment 3: Would recommend indicating the “North” direction indicator icon on your maps....it is on some, but not all.</p> <p>Resolution 3: Revised maps</p> <p>Comment 4: The shake map scenarios used on page 53, page 61, and page 69 appear to be a little old with dates of 2001 and 2006. USGS has more recent earthquake shake map scenarios that possibly may provide more recent information. As technology improves, so does much of the planning data that these models provide. You can find similar models (intensity wise and fault) in the 2012 section of the USGS shake map scenarios...here is the link. http://earthquake.usgs.gov/earthquakes/shakemap/list.php?y=2012&s=1</p>
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				Resolution 4: Updated maps to newest scenarios
City of Manhattan Beach	Ronald Laursen	Fire Battalion Chief	rlaursen@citymb.info	None
City of Palos Verdes Estates	Marcelle Herrera	Community Relations Officer/Emergency Services Coordinator	mherrera@pvestates.org	None
City of Rancho Palos Verdes	Tracy Bonano	Senior Analyst / Emergency Manager	tracyb@rpvca.gov	None
City of Redondo Beach	Issac Yang	Fire Division Chief, Special Services/Disaster Preparedness	Issac.Yang@redondo.org	None
City of Rolling Hills	Ray Cruz	City Manager	rcruz@cityofrh.net	None
City of Rolling Hills Estates	Greg Grammer	Assistant City Manager	GregG@ci.rolling-hills-estates.ca.us	None
City of Torrance	Dariusz Wawryk	Police Sergeant	DWAWRYK@TorranceCA.gov	None
Los Angeles County Public Works, Building & Safety Division	Kit Bagnell	Asst. Superintendent of Building	kbagnell@dpw.lacounty.gov	None
SoCal Gas	Faviola Ochoa	Public Affairs Manager, South Bay	FaviOchoa@semprautilities.com	None
So. California Edison	John Tierney	Account Manager	John.tierney@sce.com	None
California Water Service Company	Dan Trejo	Asst. District Manager	dtrejo@calwater.com	None

In advance of the City Council public meeting to provide input to the Second Draft Plan, the general public (via City Council public notice at City Hall and website) and external agencies (via email invitation) were informed of the Plan and encouraged to provide input during the plan writing phase. Gathered comments from the City Council, public and external agencies were noted in the Third Draft Plan prior to submission to Cal OES.

Q&A | ELEMENT C. MITIGATION STRATEGY | C1

Q: C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

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

Capability Assessment – Existing Resources to Support Mitigation

The City will incorporate mitigation planning as an integral component of daily operations. This will be accomplished by the Planning Team working with their respective departments to integrate mitigation strategies into the planning documents and operational guidelines within the City. In addition to the Capability Assessment below, the Planning Team will strive to identify



additional policies, programs, practices, and procedures that could be created or modified to address mitigation activities (see Plan Maintenance Section).

Table: Capability Assessment - Existing Resources to Support Mitigation

Resource Type	Resource Name	Ability to Support Mitigation
Personnel	Administrative Services	<i>Administrative Services Department is responsible for business license, finance/accounting functions including accounts payable and accounts receivable, human resources, risk management, payroll and utility billing. The Administrative Services Department also prepares the City's annual operating budget.</i>
Personnel	General Administration	<i>The department consists of the following divisions and functions: City Clerk, City Manager's Office, Economic Development, Information Technology, LA County Sheriff's Department Coordination, transportation program management including the Lifeline, Dial-a-Ride and Dial-a-Taxi programs, parking citations and emergency preparedness.</i>
Personnel	Community and Economic Development	<i>Community and Economic Development Department consists of the following divisions and functions: Planning, Economic Development, Neighborhood Preservation, oversight of LA County Animal Control, and Film Permits. In addition, the department ensures business growth and other improvements to the local economy, as well as acting as a liaison between the City and local businesses. Mitigation actions relating to planning and economic development can be managed by this department.</i>
Personnel	Building and Safety	<i>Building and Safety Department is outsourced to the County of Los Angeles Public Works Department. Building and Safety safeguards the community by preserving public health, safety, and welfare through effective application of building laws and regulations.</i>
Personnel	Public Works	<i>Public Works Department is responsible for City-owned infrastructure, including streets, bike lanes and sidewalks, storm drains, water and wastewater systems, traffic signals, and streetlights. It also provides water and wastewater services to the City, and handles water conservation programs. Mitigation actions involving new or retrofitted public infrastructure, as well as those related to water conservation, fall within the purview of the Public Works Department.</i>
Personnel	City Attorney	<i>City Attorney is outsourced to a private law firm who provides legal counsel to the City Council, the City Manager, and the various City departments, represents the City in litigation or to manage outside</i>



Resource Type	Resource Name	Ability to Support Mitigation
		<i>counsel representing the City in litigation, helps the City avoid litigation whenever possible, drafts ordinances and resolutions, prosecutes violations of the Municipal Code, manages the cost of legal services, and supports the City Council in the development and adoption of policy.</i>
Personnel	Fire	<i>Fire and emergency medical services are outsourced to the Los Angeles County Fire Department. The department provides fire suppression, fire prevention, hazardous materials response, and life safety services to Lomita.</i>
Personnel	Law Enforcement	<i>Law enforcement services are outsourced to the Los Angeles County Sheriff's Department. The department provides law enforcement and crime prevention services to Lomita.</i>
Personnel	Hazard Mitigation Steering Committee	<i>Hazard Mitigation Steering Committee is made up of representatives from each of the department assigned mitigation action items in the Hazard Mitigation Plan. In addition to responsibility to prepare each of the 5-year plan updates as required by FEMA, the Steering Committee is responsible for implementing, monitoring, and evaluating the plan during its quarterly meetings. The Steering Committee plays a pivotal role in writing, implementing, and funding mitigation action items.</i>
Personnel	Parks and Recreation Department	<i>Parks and Recreation Department is responsible for all adult and youth recreation classes and activities, city facilities maintenance (parks and city buildings) and certain landscaped medians throughout the City, special events and the Lomita Railroad Museum.</i>
Plans	Emergency Operations Plan	<i>Emergency Operations Plan is a reference and guidebook to operations during a major emergency impacting Lomita. The Plan includes a discussion on a wide range of hazards, organization and staffing of the Emergency Operations Center, and connectivity with field responders and external agencies. The Emergency Operations Plan is an excellent source of hazard information for the Hazard Mitigation Plan.</i>
Plans	Hazard Mitigation Plan	<i>The City's Hazard Mitigation Plan identifies the risks from natural hazards present in the community and includes strategies to reduce these risks. Updates to the Plan are coordinated with the hazard information and mitigation activities identified in the County of Los Angeles HMP as well as the HMP for the State of California in order to ensure a more consistent and unified approach to hazard mitigation.</i>
Plans	General Plan	<i>General Plan outlines long-term direction for</i>



Resource Type	Resource Name	Ability to Support Mitigation
		<i>development and policy in Lomita. There are opportunities to coordinate local hazard mitigation actions with policies governed by the General Plan. Next update to General Plan Safety Element should include cross-reference to Hazard Mitigation Plan. Also, General Plan is an excellent resource to assist with implementing many of the mitigation action items identified in the Hazard Mitigation Plan.</i>
Plans	Capital Improvement Program	<i>The Capital Improvement Program directs construction activities for City-owned facilities and infrastructure for the next five years. Mitigation actions may involve construction of new or upgraded facilities and infrastructure.</i>
Plans	Urban Water Management Plan	<i>2015 Urban Water Management Plan provides long-range planning of water supplies and water use to ensure a stable water supply and compliance with water conservation efforts. Mitigation actions that involve reducing water use may be incorporated into the next update to the Urban Water Management Plan.</i>
Plans	Storm Drain Study	<i>2008 Storm Drain Study was conducted by Los Angeles County Department of Public Works - Design Division. The study included an assessment of six locations within the City that had been reported to have experienced localized flooding. The study evaluated the existing storm drain facilities and other conditions at each location and gave a recommendation for improving conditions to reduce the likelihood of flooding.</i>
Policy	Zoning Ordinance	<i>Zoning Ordinance implements the City's General Plan by establishing specific regulations for development. It includes standards for where development can be located, how buildings must be sized, shaped, and positioned, and what types of activities can occur in an area. Hazard mitigation actions that pertain to new or substantially redeveloped buildings can be adopted into the Zoning Ordinance.</i>
Policy	Building Code	<i>Building Code specifies how new structures can be built. It includes the California Building Code, in addition to any amendments made by the City. Mitigation actions may involve amending the Building Code to improve a building's safety or structural stability.</i>

Q&A | ELEMENT A: PLANNING PROCESS | A4

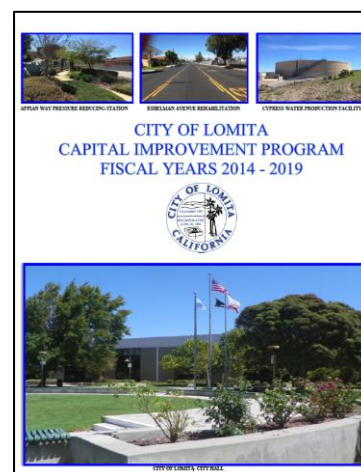
Q: A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))

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. The resources are listed below and along with a reference to where the information was used in the Plan:

- ✓ City of Lomita General Plan
 - Land Use Element – Risk Assessment, Community Profile
 - Housing Element – Community Profile
 - Safety Element – Risk Assessment, Hazard-Specific Sections, General Hazard Overviews
- ✓ Urban Water Management Plan (2015) – Hazard-Specific Sections
- ✓ Capital Improvement Program (2014-2019) - Mitigation Actions Matrix
- ✓ County of Los Angeles All-Hazards Mitigation Plan (2014) – Risk Assessment
- ✓ California State Hazard Mitigation Plan (2013) – Risk Assessment
- ✓ HAZUS maps and reports – Hazard-Specific Sections
- ✓ FEMA “How To” Mitigation Series (386-1 to 386-9) - Introduction
- ✓ National Oceanic and Atmospheric Administration statistics – Community Profile
- ✓ FEMA Flood Insurance Rate Maps – Flood Hazards



Q&A | ELEMENT E: PLAN ADOPTION | E1

Q: E1. 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

Following distribution of the Second Draft Plan to the general public and external agencies, the Plan was presented as an information item to the City Council on August 16, 2016 along with a request for permission to forward the document to Cal OES and FEMA for review and conditional approval. All related documentation is in the **Attachments**.



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

The City Council must adopt the Mitigation Plan before the Plan can receive a final approval by FEMA. The resolution of adoption by the City Council is in the **Attachments**.

In preparation for the public meeting with the City Council on December 4, 2018, 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.

Following the Council adoption, proof of the adoption was submitted to FEMA along with a request to issue a final approval.

Plan Approval

FEMA issued an Approval pending adoption notice on October 4, 2018. Following receipt of City Council's adoption, FEMA approved the Plan on December 18, 2018. A copy of the FEMA Letter of Approval is in the **Attachments**.



Part II: RISK ASSESSMENT

Community Profile

Geography and the Environment

According to the General Plan, the City of Lomita has an area of 1.97 square miles and is located in the South-Western portion of Los Angeles County.

The City of Lomita is located 26 miles south of downtown Los Angeles and is bounded by the City of Torrance on the north and west; the Los Angeles Harbor Region of the City of Los Angeles to the east; and the City of Rolling Hills Estates on the southwest. Southeast of Lomita is the City of Rancho Palos Verdes and unincorporated County land.

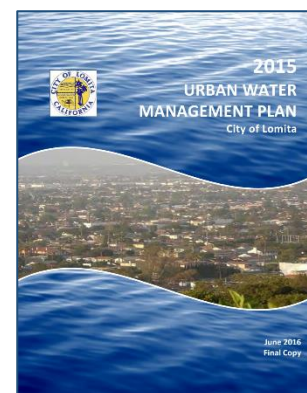


The City is almost completely developed and the remaining vacant land is limited to scattered parcels. Existing development in the City is characterized by residential neighborhoods at varying densities, with commercial uses concentrated along Pacific Coast Highway, Lomita Boulevard, Crenshaw Boulevard, Narbonne Avenue and Western Avenue.

Climate

According to the City of Lomita's Urban Water Management Plan (2015), the City has a Mediterranean climate with moderate, dry summers with an average temperature of about 70°F and cool, wet winters with an average temperature of 54°F. The average annual rainfall for the region is 14.6 inches. Historically, the City receives just under average rainfall than other cities in the area (about 1 inch less than the regional average of 14.6).

As the State of California and the Los Angeles region has undergone a several-year drought, rainfall has been much lower in the City. However, rainfall totals should increase as the City is expected to be in an El Niño year for 2016.



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

Land and Development

The City of Lomita General Plan provides the framework for the growth and development of the City, including, the use and development of private land, including residential, industrial and commercial areas. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.



The environment of most Los Angeles County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is seamless to most people. Consequently, many Los Angeles County communities are at-risk for the same natural hazards.

Q&A | ELEMENT D: MITIGATION STRATEGY | D1

Q: D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))

A: See **Changes in Development** below

Changes in Development

This section is intended to discuss recent development (since the writing of the first Mitigation Plan) as well as planned potential development, or conditions that may affect the risks and vulnerabilities (e.g. addition of high-risk industrial uses). Since the adoption of the 2004 Mitigation Plan, there have been no significant alterations to the development pattern of the City in the hazard areas via the General Plan or Zoning Ordinance. In light of the minor economic downturn in the community since the last Plan, it's likely the vulnerability has actually decreased. Additionally, there has been no development allowed in specific geographically-defined hazard-prone areas (e.g. floodplains). This conclusion was reached after a discussion by the Planning Team.

Population and Demographics

According to the City's General Plan - Housing Element, in 1964, at the time of Lomita's incorporation, the City's population was approximately 15,000 residents. By the time of the 2010 Census, the population grew to 20,256.

The census data indicates that the City's population was relatively stable between 1970 and 1980. During the decade following 1970, the City's population actually declined. Since 2000, the City's population growth rate has been stagnant. From 2000 to 2010 Lomita experienced an average rate of growth of just 0.1 percent annually. The variables affecting this relatively low growth may be attributed to the lack of vacant land in the City and its aging population. Similarly, the population of Los Angeles County experienced a growth rate of 0.3 percent per year. Lomita's population growth in the past decade is slightly less than that experienced in the County as a whole.

According the City of Lomita General Plan - Housing Element, the demographic makeup of the City is as follows:



Table: City of Lomita Demographics
(Source: City of Lomita General Plan – Housing Element 2013-2021)

Racial/Ethnic Group	2000	2010	Change	Change %
White	13,263	11,987	-1,276	-9.6%
Black	838	1,075	237	28.3%
American Indian Eskimo	141	174	33	23.4%
Asian or Pacific Islander	2,392	2,923	531	22.2%
Other	3,412	4,097	685	20.1%
Total	20,046	20,256	210	1.0%
Hispanic	5,252	6,652	1,400	26.7%

Housing and Community Development

Table: City of Lomita Housing
(Source: City of Lomita General Plan – Housing Element 2013-2021)

2010	Number	Percent %
Housing Type:		
1-unit, detached	3,972	49.0 %
1-unit, attached	955	11.8 %
2-4 Units	516	6.4 %
5+ Units	2,179	27.0 %
Mobile homes/Other	476	5.8 %
Housing Statistics:		
Total Available Housing Units	7,871	100 %
Owner-Occupied Housing	3,585	45.5 %
Renter-Occupied	4,286	54.5 %
Average Household Size:	2.49 persons	
Median Home Price:	\$401,000	

The City participates in the Community Development Block Grant (CDBG) program. The primary resource available to address non-housing community development needs is the CDBG. The U.S. Department of Housing and Urban Development (HUD) provides funding for City of Lomita's Community Program. Annually, the City receives approximately \$150,000 in CDBG funds.



Employment and Industry

The employment opportunities in Lomita are located mainly in the commercial retail and service sectors found along the major roadways in the City. This limited employment base suggests that most residents work outside the City in major employment centers in Torrance, Long Beach, the Harbor, and the Carson-Compton area.

Table: City of Lomita Industry

(Source: City of Lomita General Plan – Housing Element 2013-2021)

Industry	Number	Percent %
Agriculture, forestry, fishing and hunting, and mining	102	0.95%
Construction	662	6.14%
Manufacturing	1,301	12.07%
Wholesale Trade	573	5.31%
Retail Trade	1,117	10.36%
Transportation and Warehousing, and Utilities	635	5.89%
Information	211	1.96%
Finance and insurance, and real estate and rental and leasing	493	4.57%
Professional, scientific, and management, and administrative and waste management services	1,169	10.84%
Educational services, and health care and social assistance	2,239	20.76%
Arts, entertainment, and recreation, and accommodation and food services	1,506	13.97%
Other services, except public administration	580	5.38%
Public administration	195	1.81%

Table: City of Lomita Occupation

(Source: City of Lomita General Plan – Housing Element 2013-2021)

Occupation	Number	Percent
Civilian employed population (16 years and over)	10,149	100.0 %
Management, business, science, and arts occupations	3,565	35.1 %
Service occupations	1,689	16.6 %
Sales and office occupations	3,276	32.2 %
Natural resources, construction, and maintenance occupations	858	8.5 %
Production, transportation, and material moving occupations	761	7.5 %



Transportation and Commuting Patterns

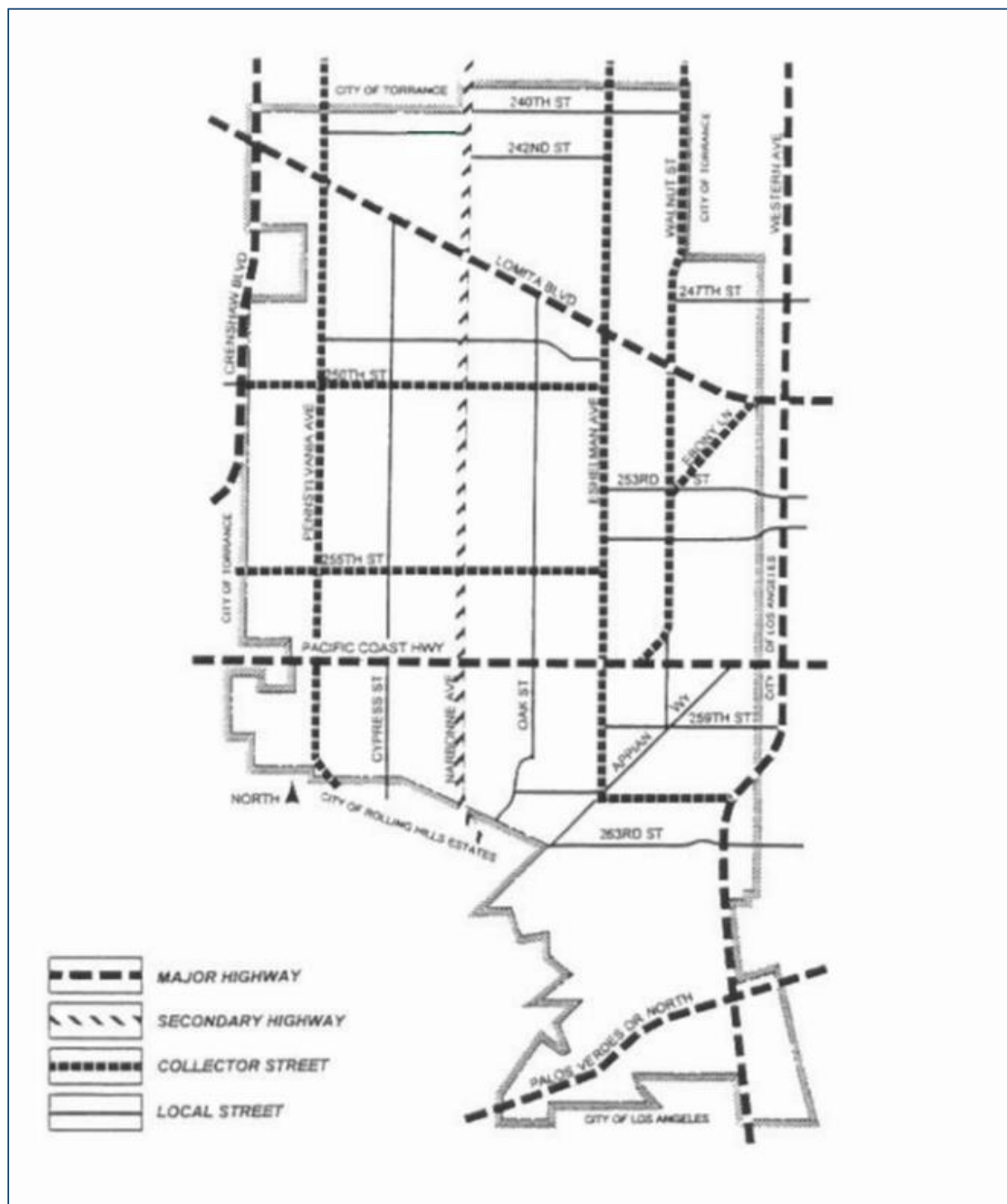
There are approximately 55 miles of roadways in the City. The street system is defined by major north-south streets such as Crenshaw Boulevard, Narbonne Avenue, Eshelman Avenue, and Western Avenue and east-west streets including Pacific Coast Highway, Lomita Boulevard and Palos Verdes Drive North. Other local residential streets generally form an uneven grid at varying intervals reflecting earlier subdivision patterns. Streets within the southernmost portion of the City are more curvilinear and follow the local topography.

Freeway access to the City is provided indirectly by Pacific Coast Highway (SR-1) which runs in an east-west direction through the City's southern section. Pacific Coast Highway connects to the Harbor Freeway (SR-110) approximately 3.5 miles to the east. Western Avenue and Crenshaw Avenue are major arterial roadways along the western and eastern borders of the City of Lomita and provide connections to the San Diego Freeway (I-405) approximately 8 miles to the north.

The City of Lomita receives bus service from the Metropolitan Transit Authority (MTA), Torrance Transit, GTrans, and LADOT Commuter Express. Routes that serve the City are T5, T9, T10, 232, CE448, GA2, and 205.

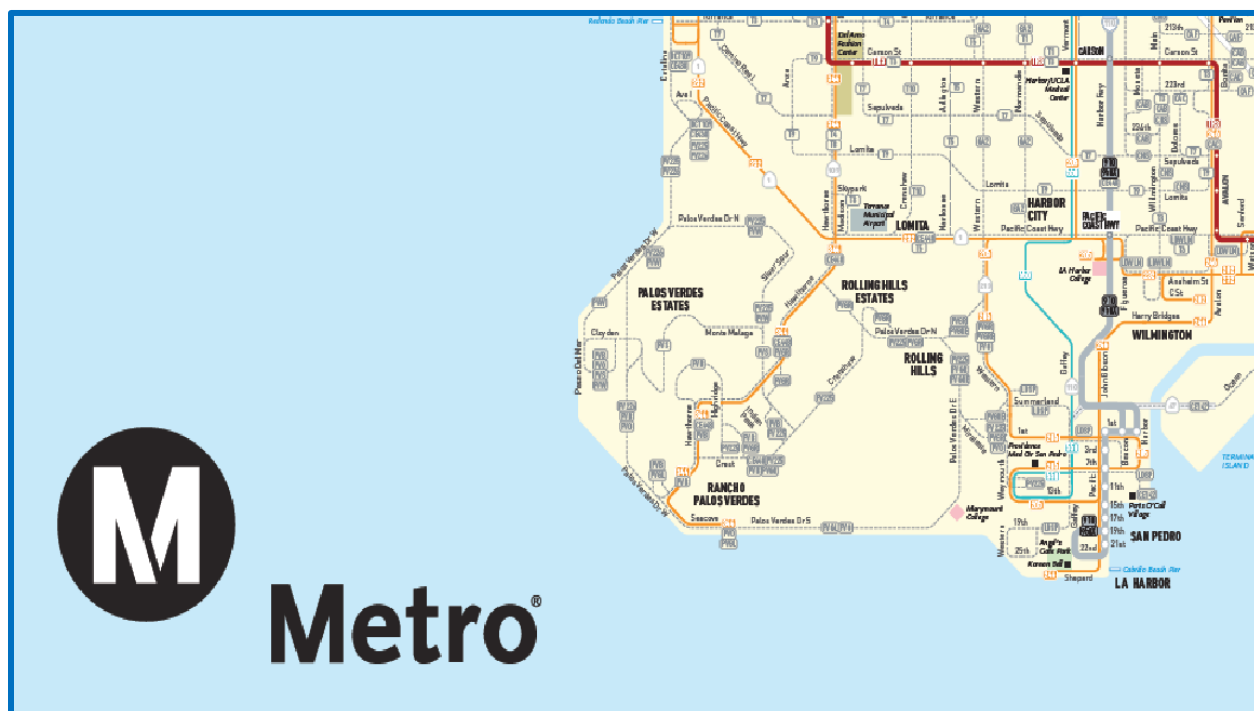


Map: Major Arterial Roads
(Source: City of Lomita General Plan – Circulation Element 1998)





Map: Public Transit
(Source: Metro Bus Service Map 2015)



Risk Assessment

What is a Risk Assessment?

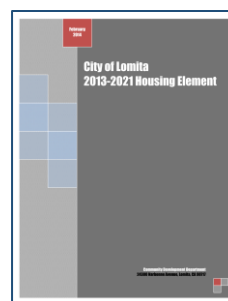
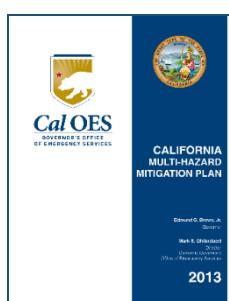
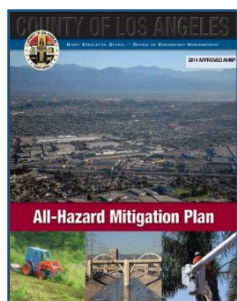
Conducting a risk assessment can provide information regarding: the location of hazards; the value of existing land and property in hazard locations; and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the five levels of a risk assessment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

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 Lomita 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.

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



The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the City's General Plan and City's Emergency Operations Plan. In addition, numerous internet resources and the County of Los Angeles 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:

Earthquake | Localized Flooding | Windstorm | Drought

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



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

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



Table: Calculated Priority Risk Index Ranking for City of Lomita

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Ranking
Earthquake – San Andreas M7.8	3	1.35	2	0.6	4	0.6	1	0.1	2.65
Earthquake – Newport/Inglewood M6.9	3	1.35	3	0.9	4	0.6	1	0.1	2.95
Earthquake – Palos Verdes M7.1	2	0.9	4	1.2	4	0.6	1	0.1	2.80
Localized Flooding	4	1.80	1	0.3	1	0.15	2	0.2	2.45
Windstorm	4	1.80	1	0.3	1	0.15	2	0.2	2.45
Drought	3	1.35	1	0.3	1	0.15	4	0.4	2.20

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of the City's facilities, infrastructure, and environment may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in the Hazard-Specific Sections. **Table: Vulnerability: Location, Extent, and Probability for City of Lomita** 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 | B1

Q: B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

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

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

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



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

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often)*	Most Recent Occurrence
Earthquake	Entire Project Area	The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7 % probability that an earthquake of M6.7 or greater will hit California within 30 years. ¹	Moderate	1933 – Long Beach Earthquake 1994 – Northridge Earthquake
Localized Flooding	Isolated pockets of Project Area. See Flooding Hazards - Local Conditions	Localized Urban Flooding from Severe Weather	High	Not for several decades since construction of the storm drain system.
Windstorm	Entire Project Area	30 miles per hour or greater	High	April 2016
Drought	Entire Project Area	Droughts in urban areas vary considerably in scope and intensity. Likely emergency water shortage regulations would restrict such activities as watering of landscape, washing of cars, and other non-safety related activities.	Moderate	None
* Probability is defined as: Low = 1:1,000 years, Moderate = 1:100 years, High = 1:10 years				
¹ Uniform California Earthquake Rupture Forecast				

3) Vulnerability Assessment/Inventory of Existing Assets

This is a combination of hazard identification with an inventory of the existing (or planned) property development(s) and population(s) exposed to a hazard. Critical facilities are of particular concern because these locations provide essential equipment or provide services to the general public that are necessary to preserve important public safety, emergency response, and/or disaster recovery functions. The critical facilities have been identified and are illustrated in **Table: City of Lomita Critical Facilities Vulnerable to Hazards**.

4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses have been included in the hazard assessment. Data



was not available to make vulnerability determinations in terms of dollar losses for all of the identified hazards. The **Mitigation Actions Matrix** includes an action item to conduct such an assessment in the future.

5) Assessing Vulnerability/ Analyzing Development Trends

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

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

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

Critical and Essential Facilities

Facilities critical to government response activities (i.e., life safety and property and environmental protection) include: local government 9-1-1 dispatch centers, emergency operations centers, local police and fire stations, local public works facilities, local communications centers, schools (shelters), and hospitals. Also, facilities that, if damaged, could cause serious secondary impacts are also considered "critical". A hazardous materials facility is one example of this type of critical facility.

Essential facilities are those facilities that are vital to the continued delivery of key City services or that may significantly impact the City's ability to recover from the disaster. These facilities include but are not limited to: schools, public services building, community corrections centers, a courthouse, juvenile services buildings, and other public facilities.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Critical and Essential Facilities Vulnerable to Hazards** below



Table: Critical and Essential Facilities Vulnerable to Hazards illustrates the critical and essential facilities providing services to the City of Lomita, including hazard vulnerabilities.

Table: Critical and Essential Facilities Vulnerable to Hazards
(Sources: General Plan, Master Water Plan)

Facility Description	Earthquake	Localized Flooding	Windstorm	Drought
City Hall - Located at 24300 Narbonne Avenue	X		X	X
Lomita Park – Tom Rico Rec Center - Located at 24428 Eshelman Avenue	X	X	X	X
Lomita Park – Stephenson Center - Located at 24428 Eshelman Avenue provides daily senior services.	X	X	X	X
Cypress Water Production Facility - Located at 26112 Cypress Street has a 5.3-million-gallon capacity.	X		X	X
Harbor Hills Elevated Reservoir An elevated steel reservoir built in 1940 and is located on Palos Verdes Drive North, west of Western Avenue in the City of Lomita. The reservoir is made of riveted steel and has a capacity of 100,000 gallons. This reservoir is 22 feet in diameter, 35 feet tall and stands 75 feet above ground. The influent and effluent piping is combined through a 10-inch main that supplies Zone III. This reservoir was rehabilitated in 2014 and meets all current standards.	X		X	X
Well No. 5 Located at 26112 Cypress Street is a main component of the Cypress Water Production Facility.	X		X	X
Los Angeles County Fire Department - Fire Station No. 6 Located at 25517 Narbonne Avenue	X		X	X
Hospital – Torrance Memorial Medical Center Located at 3330 Lomita Boulevard in Torrance provides emergency care and other medical services.	X		X	X
Los Angeles County Sheriff Department – Lomita Station Located at 26123 Narbonne Avenue	X		X	X
Lomita Water Maintenance Located at 24373 Walnut Avenue	X		X	X
Water Pump Station 26255 Appian Way	X	X	X	X



Location of Land Uses by Hazard

City of Lomita's General Plan – Land Use Element identifies a broad range of land uses including residential, commercial/industrial, park, and public/institutional. In terms, the land uses are categorized as residential, commercial/industrial, park, and public/institutional. Following is a generalized assessment of the proximity of hazards to those land uses.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

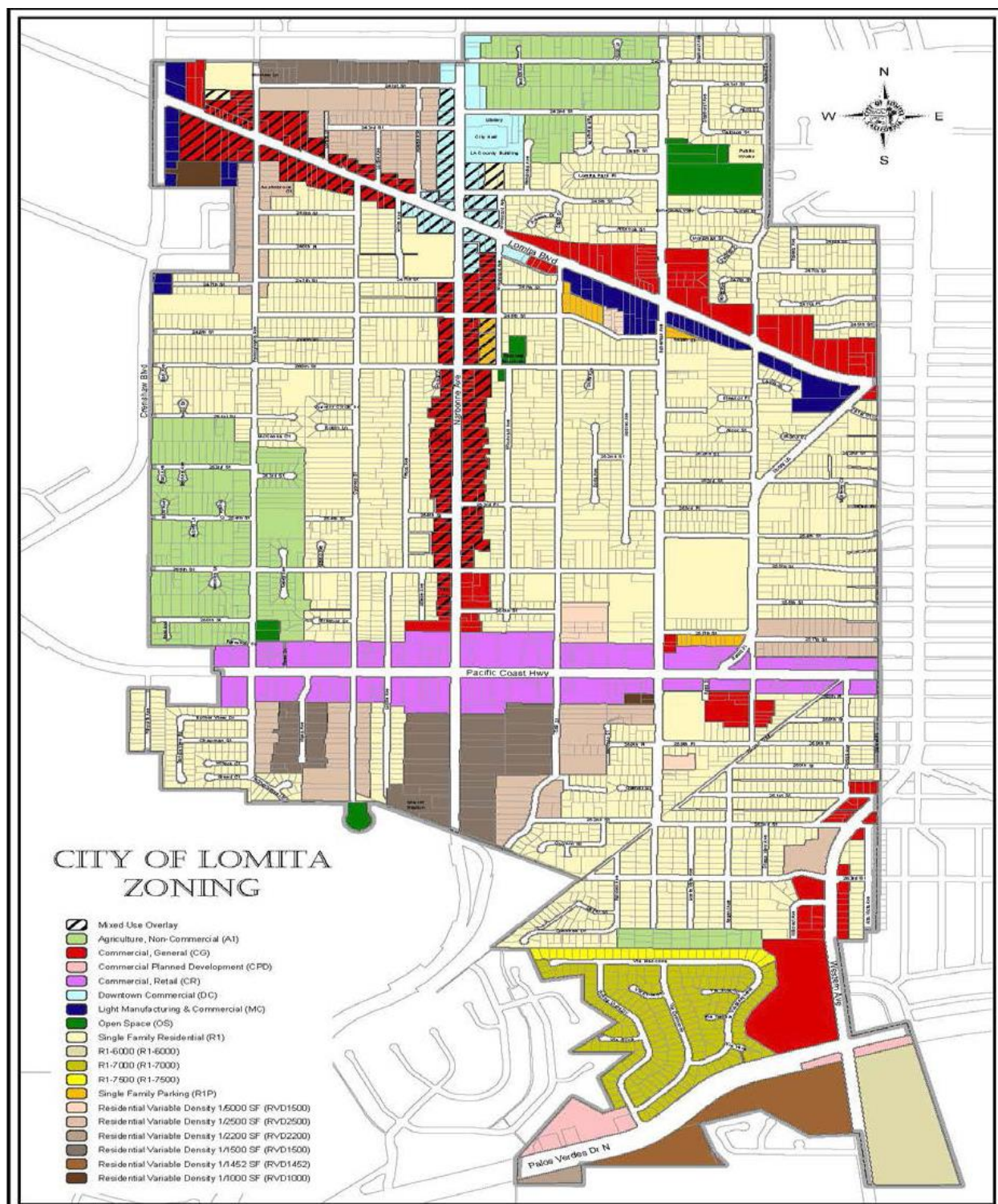
A: See **Location of Land Uses by Hazard** below

Table: Location of Land Uses by Hazard
(Source: EPC Analysis of City of Lomita General Plan – Land Use Element)

Category of Structure	Earthquake	Localized Flooding	Windstorm	Drought
Residential	X	X	X	X
Commercial/Industrial	X		X	X
Park	X		X	X
Public/Institutional	X		X	X



Map: Zoning
(Source: City of Lomita)





Earthquake Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See below

Previous Occurrences of Earthquakes in the City of Lomita

The two following earthquake events significantly impacted the region surrounding Lomita.

According to USGS, the 1933 Long Beach earthquake caused serious damage to weak masonry structures on land fill from Los Angeles south to Laguna Beach. Property damage was estimated at \$40 million, and 115 people were killed.

Severe property damage occurred at Compton, Long Beach, and other towns in the area. Most of the spectacular damage was due to land fill, or deep water-soaked alluvium or sand, and to badly designed buildings. Minor disturbances of ground water, secondary cracks in the ground, and slight earth slumps occurred, but surface faulting was not observed. Along the shore between Long Beach and Newport Beach, the settling or lateral movement of road fills across marshy land caused much damage to the concrete highway surfaces and to approaches to highway bridges.

More recently in January 1994, the magnitude 6.7 Northridge Earthquake (thrust fault) which produced severe ground motion, caused 57 deaths, 9,253 injuries and left over 20,000 displaced. Scientists have stated that such devastating shaking should be considered the norm near any large thrust earthquake. Recent reports from scientists of the U.S. Geological Survey and the Southern California Earthquake Center say that the Los Angeles Area could expect one earthquake every year of magnitude 5.0 or more for the foreseeable future.

Previous Occurrences of Earthquakes in Los Angeles County

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

Paleoseismological research indicates that large magnitude (8.0+) earthquakes occur on the San Andreas Fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake, the 1971 San Fernando Earthquake, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

Local Conditions

According to the City of Lomita General Plan - Safety Element (1998), the City lies within a metropolitan area that has historically been seismically active. Faults are prevalent throughout California and are commonly classified as either “active” or “potentially active.” An active fault is a break that has moved in recent geologic time (the last 11,000 years) and that is likely to move



within the next approximately 100 years. Active faults are the primary focus of concern in attempting to prevent earthquake hazards. A potentially active fault is one that has shifted but not in the recent geologic period (or, between 11,000 and 3,000,000 years ago) and is therefore considered dormant or unlikely to move in the future.

Several active faults have been identified within close proximity to the boundaries of the City which, most importantly, indicates that the community falls under the State Earthquake Fault Zoning Act and the State Hazards Mapping Act. These Acts require that local governments, in the general plan update process, adopt policies and criteria to ensure the structural adequacy of buildings erected across active faults for human occupancy. In some cases, the development of structures must be prohibited. Verification that the above Acts pertain to Lomita was obtained through correspondence with the State Department of Conservation and is on file with the City Planning Division.

Earthquakes that could affect the City would most likely originate from the San Andreas, Newport-Inglewood, or Palos Verdes Faults. These faults are close enough in proximity or expected to generate strong enough shaking that could affect the City. The level of seismicity in Lomita, both as to maximum credible earthquake intensity and likely earthquake occurrences, is considered to be approximately the same as for the Los Angeles Basin.

Despite the fact that Lomita faces limited threats from interior seismicity, there are a number of active faults in southern California that could potentially move and thus result in hazards to the community.

The San Andreas Fault is approximately 55 miles northeast of the City, and is considered the most seismically active fault in the southern California region.

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. The other active faults closest to or within 20 miles of Lomita include the Newport-Inglewood and the Palos Verdes Fault. A significant earthquake originating along any of these or other regional faults could cause damage to buildings and infrastructure as well as injuries and fatalities in Lomita.

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

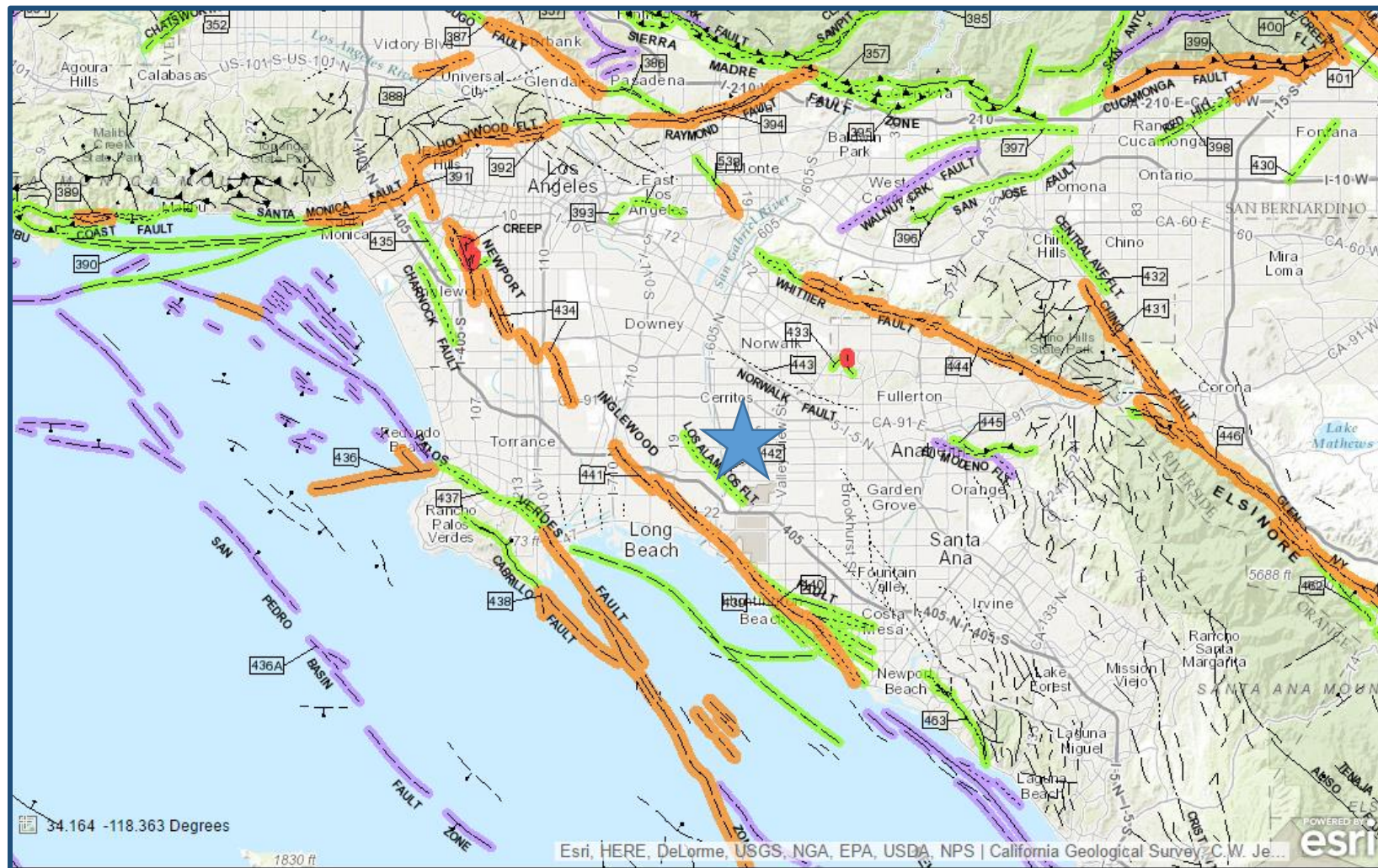
Map: Regional Faults plots the various major faults located near the City of Lomita. The closest active faults to Lomita are the Palos Verdes and Newport-Inglewood Faults.



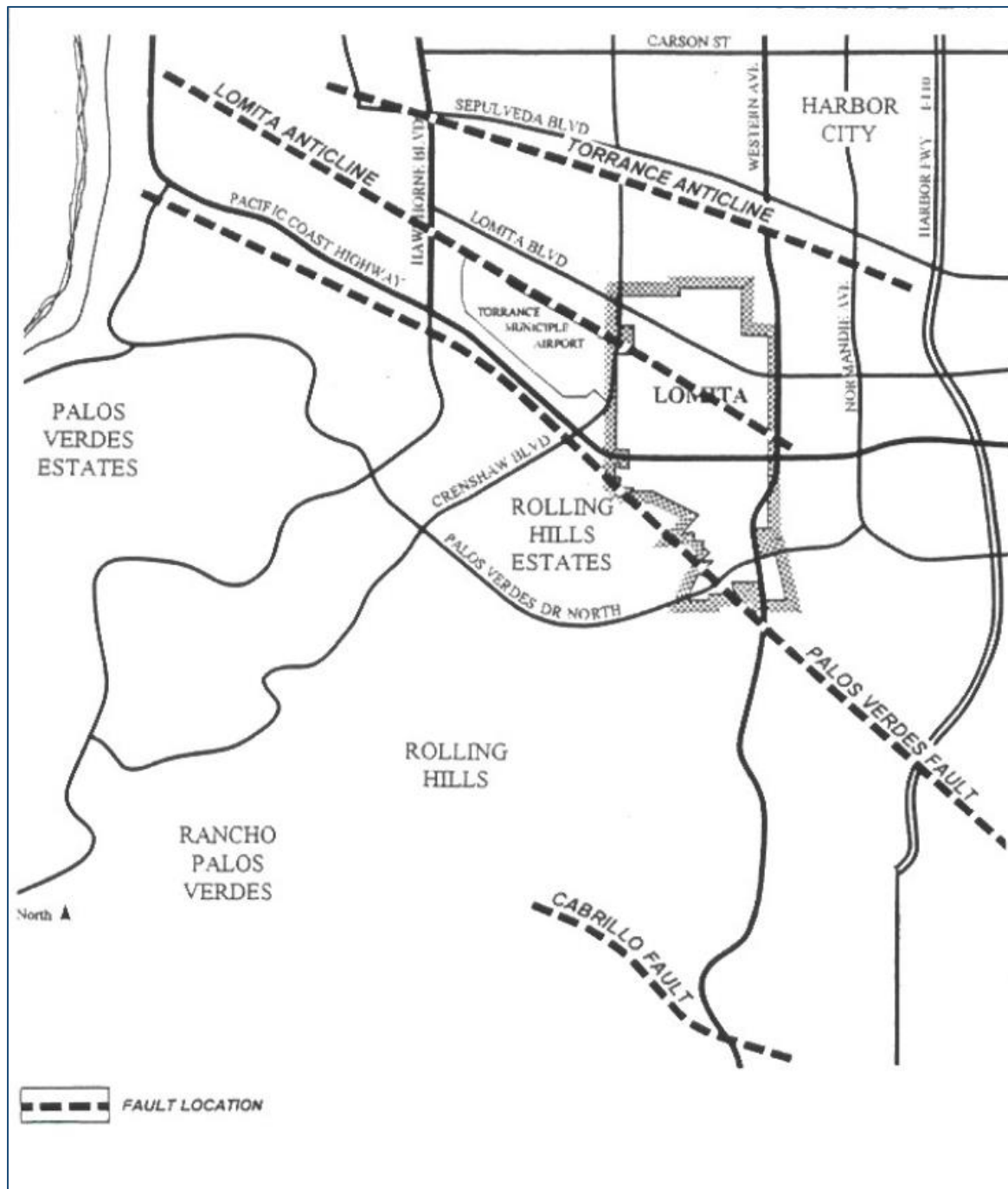
Map: Regional Faults

(Source: State of California Department of Conservation)

(Location of Lomita indicated with Blue Star)



Map: Local Faults
(Source: City of Lomita General Plan – Safety Element 1998)





Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Earthquakes in the City of Lomita** below

Impact of Earthquakes in the City of Lomita

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

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

Earthquake-Induced Landslides

Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

Map: Landslide and Liquefaction Zones shows the relatively low risk of earthquake-induced landslide risk within the City. The closest area of earthquake-induced landslide potential is on the southwestern boundary of the City with Rolling Hills Estates. Although this area is prone to landslides, it does not fall within the City boundaries.

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.



In the City of Lomita, the groundwater table (used to determine the risk of liquefaction) is mostly over 100 feet below the surface. This results in a lack of groundwater near the surface, leaving much of the City in a low liquefaction-risk area. Additionally, the fossiliferous coarse sand soils upon which Lomita is built facilitate liquefaction prevention.

Exposure

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

Building Inventory

HAZUS estimates that there are 6 thousand buildings in the region which have an aggregate total replacement value of 2,000 (millions of dollars). In terms of building construction types found in the region, wood frame construction makes up 82% 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.

Table: Critical Facility Inventory – HAZUS

Essential Facilities	Count	High Potential Loss (HPL) Facilities	Count
Hospitals	0	Dams	0
Schools	10	Levees	0
Fire Stations	0	Military Installations	0
Police Stations	1	Nuclear Power Plants	0
Emergency Operations Facilities	0	Hazardous Material Sites	0

Transportation and Utility Lifeline Inventory

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



Casualties

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

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

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

Building-Related Losses

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



HAZUS Earthquake Event Summary Results

San Andreas M8.0 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – San Andreas M8.0

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	14	1	0	0	0
Commercial	333	13	1	0	0
Education	13	0	0	0	0
Government	5	0	0	0	0
Industrial	95	5	1	0	0
Other Residential	792	92	14	0	0
Religion	35	1	0	0	0
Single Family	4,796	123	1	0	0
Total	6,083	235	17	0	0

Table: Expected Building Damage by Building Type – San Andreas M8.0

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	5,069	130	1	0	0
Steel	106	6	1	0	0
Concrete	99	3	0	0	0
Precast	92	5	1	0	0
RM	172	3	0	0	0
URM	29	3	0	0	0
MH	515	85	14	0	0
Total	6,083	235	17	0	0



Transportation and Utility Lifeline Damage

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

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	743	1014	254
Waste Water	446	727	182
Natural Gas	297	208	52
Oil	0	0	0

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

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,869	7,135	6,678	4,139	0	0
Electric Power		0	0	0	0	0



Casualties

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

Table: Casualty Estimates – San Andreas M8.0

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	0	0	0	0
	TOTAL	0	0	0	0
2PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	0	0	0	0
	TOTAL	0	0	0	0
5PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	0	0	0	0
	TOTAL	0	0	0	0



Economic Losses

The total economic loss estimated for the San Andreas M8.0 earthquake scenario is \$14.89 million dollars which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

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

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	\$0	\$700	\$27,300	\$700	\$3,400	\$32,100
	Capital-Related	\$0	\$300	\$24,800	\$400	\$700	\$26,200
	Rental	\$6,100	\$14,500	\$25,300	\$300	\$900	\$47,100
	Relocation	\$3,900	\$19,800	\$18,100	\$2,000	\$4,400	\$48,200
	Subtotal	\$10,000	\$35,300	\$95,500	\$3,400	\$9,400	\$153,600
Capital Stock Losses	Structural	\$156,900	\$69,500	\$48,200	\$9,700	\$12,500	\$296,800
	Non-Structural	\$1,704,200	\$966,300	\$754,700	\$150,900	\$186,000	\$3,762,100
	Content	\$792,900	\$333,500	\$521,000	\$99,800	\$129,300	\$1,876,500
	Inventory	\$0	\$0	\$10,900	\$15,900	\$1,100	\$27,900
	Subtotal	\$2,654,000	\$1,369,300	\$1,334,800	\$276,300	\$328,900	\$5,963,300
	TOTAL	\$2,664,000	\$1,404,600	\$1,430,300	\$279,700	\$338,300	\$6,116,900



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

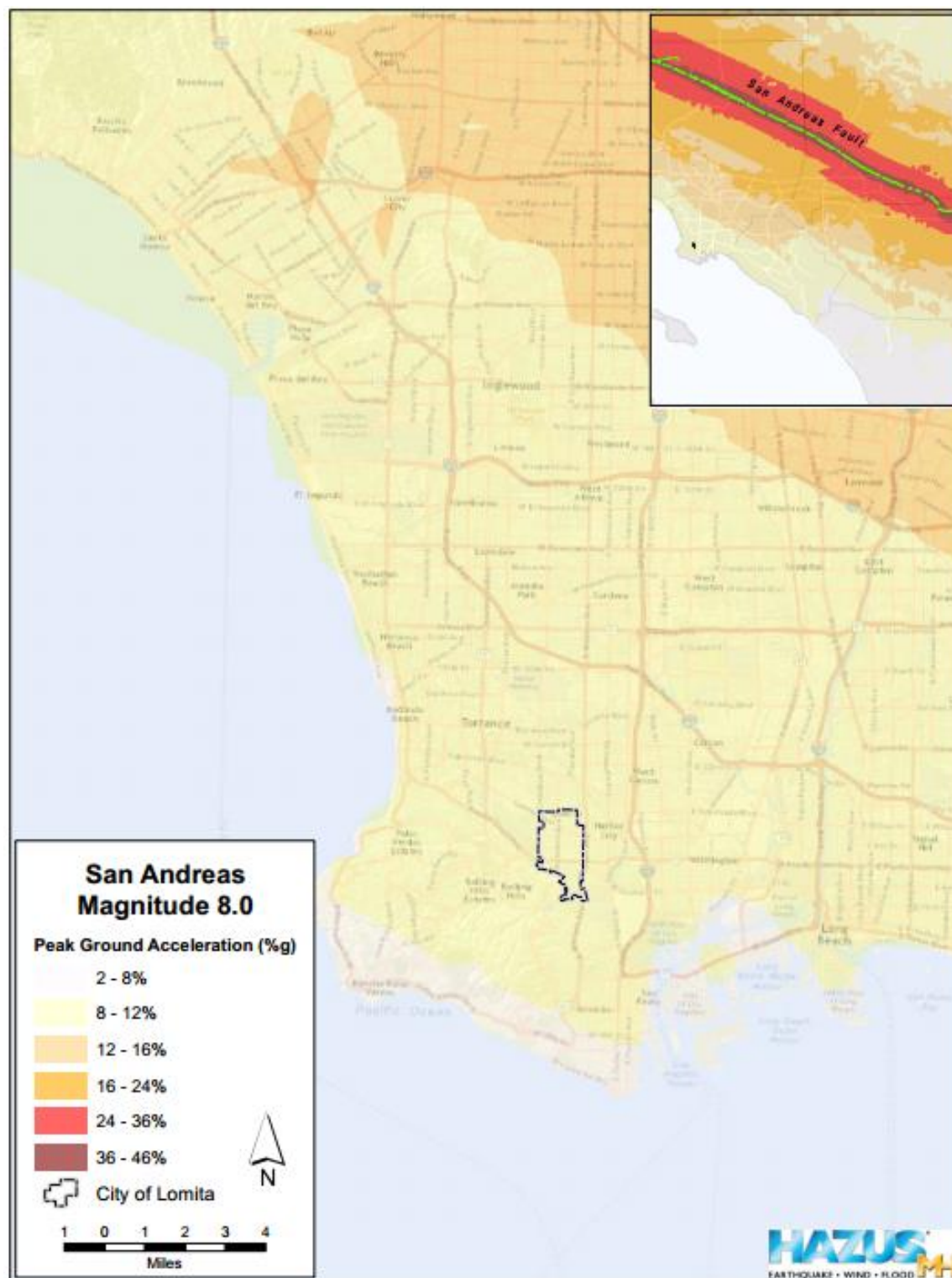
System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	\$60,263,300	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
Railways	Segments	\$0	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Light Rail	Segments	\$0	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Bus	Facilities	\$0	\$0	0%
Ferry	Facilities	\$0	\$0	0%
Port	Facilities	\$0	\$0	0%
Airport	Facilities	\$0	\$0	0%
TOTAL		\$60,263,300	\$0	



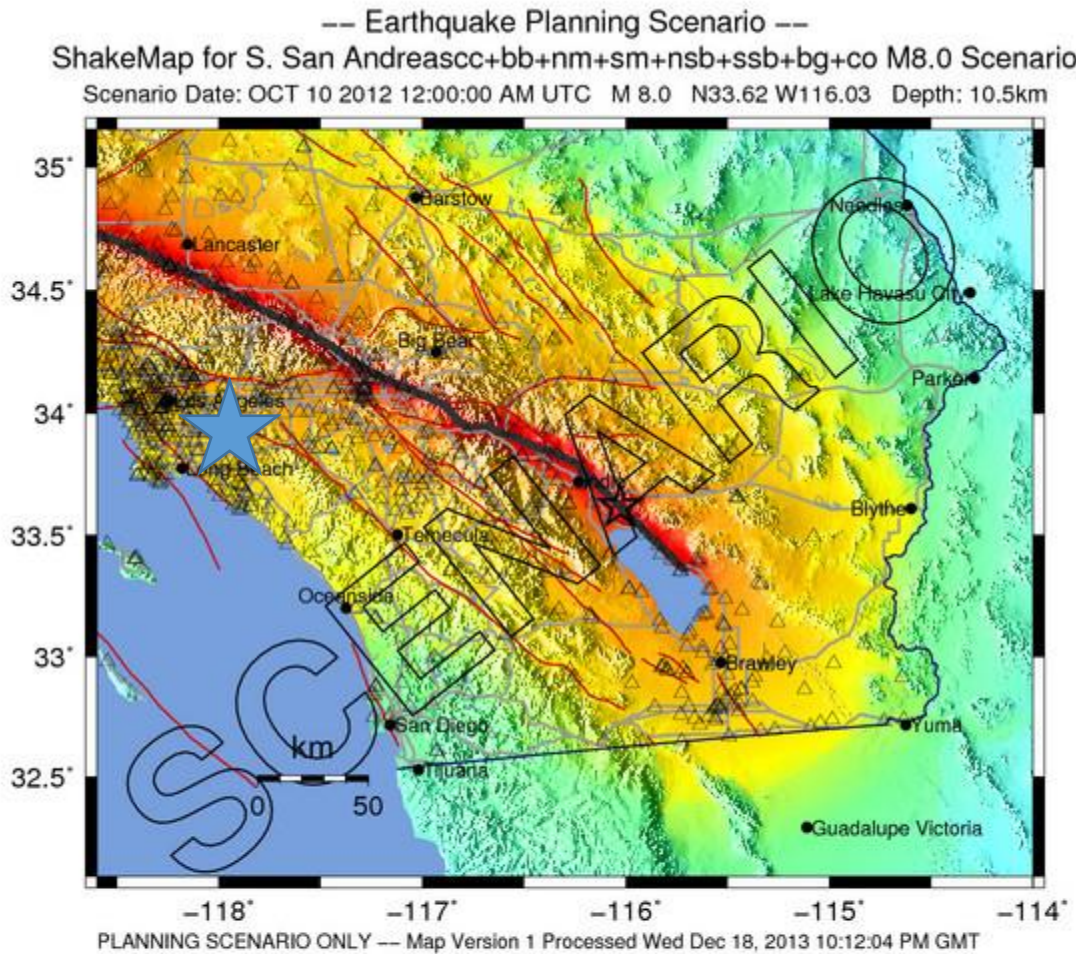
Table: Utility System Economic Losses (\$ Dollars) – San Andreas M8.0

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$14,863,300	\$4,563,800	31%
Waste Water	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$8,918,000	\$3,270,700	37%
Natural Gas	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$5,945,300	\$938,100	16%
Oil Systems	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Electrical Power	Facilities	\$0	\$0	0%
Communication	Facilities	\$0	\$0	0%
TOTAL		\$29,726,600	\$8,772,600	

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



Map: Seismic Shaking Intensities for the San Andrea Fault M8.0
(Source: State of California Department of Conservation)
(Location of Lomita shown with Blue Star)



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)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL. (cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al., 1999



Newport-Inglewood M7.1 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – Newport-Inglewood M7.1

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	7	4	3	1	0
Commercial	163	90	71	20	3
Education	7	4	2	0	0
Government	3	1	1	0	0
Industrial	44	26	23	7	1
Other Residential	263	247	263	111	13
Religion	18	10	7	2	0
Single Family	2,742	1,690	458	25	6
Total	3,247	2,071	827	166	24

Table: Expected Building Damage by Building Type – Newport-Inglewood M7.1

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	2,891	1,793	485	25	6
Steel	49	27	27	8	1
Concrete	48	28	20	6	1
Precast	40	24	25	8	1
RM	98	35	32	10	1
URM	11	9	8	3	1
MH	109	156	231	106	13
Total	3,247	2,071	827	166	24



Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Newport-Inglewood M7.1

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	743	74	18
Waste Water	446	53	13
Natural Gas	297	15	4
Oil	0	0	0

Table: Expected Potable Water and Electric Power System Performance – Newport-Inglewood M7.1

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,869	0	0	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 77 households to be displaced due to the earthquake. Of these, 46 people (out of a total population of 19,759) will seek temporary shelter in public shelters.



Casualties

The table below represents a summary of casualties estimated for the Newport-Inglewood M7.1 earthquake scenario.

Table: Casualty Estimates – Newport-Inglewood M7.1

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	8	1	0	0
	Single-Family	7	1	0	0
	TOTAL	16	2	0	0
2PM	Commercial	16	3	0	1
	Commuting	0	0	0	0
	Educational	4	1	0	0
	Hotels	0	0	0	0
	Industrial	3	1	0	0
	Other-Residential	1	0	0	0
	Single-Family	1	0	0	0
	TOTAL	26	5	1	0
5PM	Commercial	11	2	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	2	0	0	0
	Other-Residential	3	0	0	0
	Single-Family	3	0	0	0
	TOTAL	19	3	0	1



Economic Losses

The total economic loss estimated for the Newport Inglewood M7.1 scenario earthquake is \$111.09 million dollars which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Building-Related Economic Losses (\$ Dollars) – Newport-Inglewood M7.1

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	\$0	\$180,800	\$2,263,900	\$45,800	\$136,800	\$2,627,300
	Capital-Related	\$0	\$77,300	\$2,027,300	\$26,200	\$31,200	\$2,162,000
	Rental	\$659,700	\$1,085,000	\$1,209,700	\$15,300	\$58,400	\$3,028,100
	Relocation	\$2,450,600	\$1,303,900	\$1,727,200	\$107,100	\$474,400	\$6,063,200
	Subtotal	\$3,110,300	\$2,647,000	\$7,228,100	\$194,400	\$700,800	\$13,880,600
Capital Stock Losses	Structural	\$5,760,900	\$2,777,000	\$2,621,900	\$377,700	\$662,300	\$12,199,800
	Non-Structural	\$32,201,400	\$16,860,400	\$9,215,000	\$1,406,600	\$2,278,500	\$61,961,900
	Content	\$11,040,600	\$4,264,100	\$4,739,100	\$899,600	\$1,214,100	\$22,157,500
	Inventory	\$0	\$0	\$100,100	\$143,300	\$11,700	\$255,100
	Subtotal	\$49,002,900	\$23,901,500	\$16,676,100	\$2,827,200	\$4,166,600	\$96,574,300
	TOTAL	\$52,113,200	\$26,548,500	\$23,904,200	\$3,021,600	\$4,867,400	\$110,454,900



Table: Transportation System Economic Losses (\$ Dollars) – Newport-Inglewood M7.1

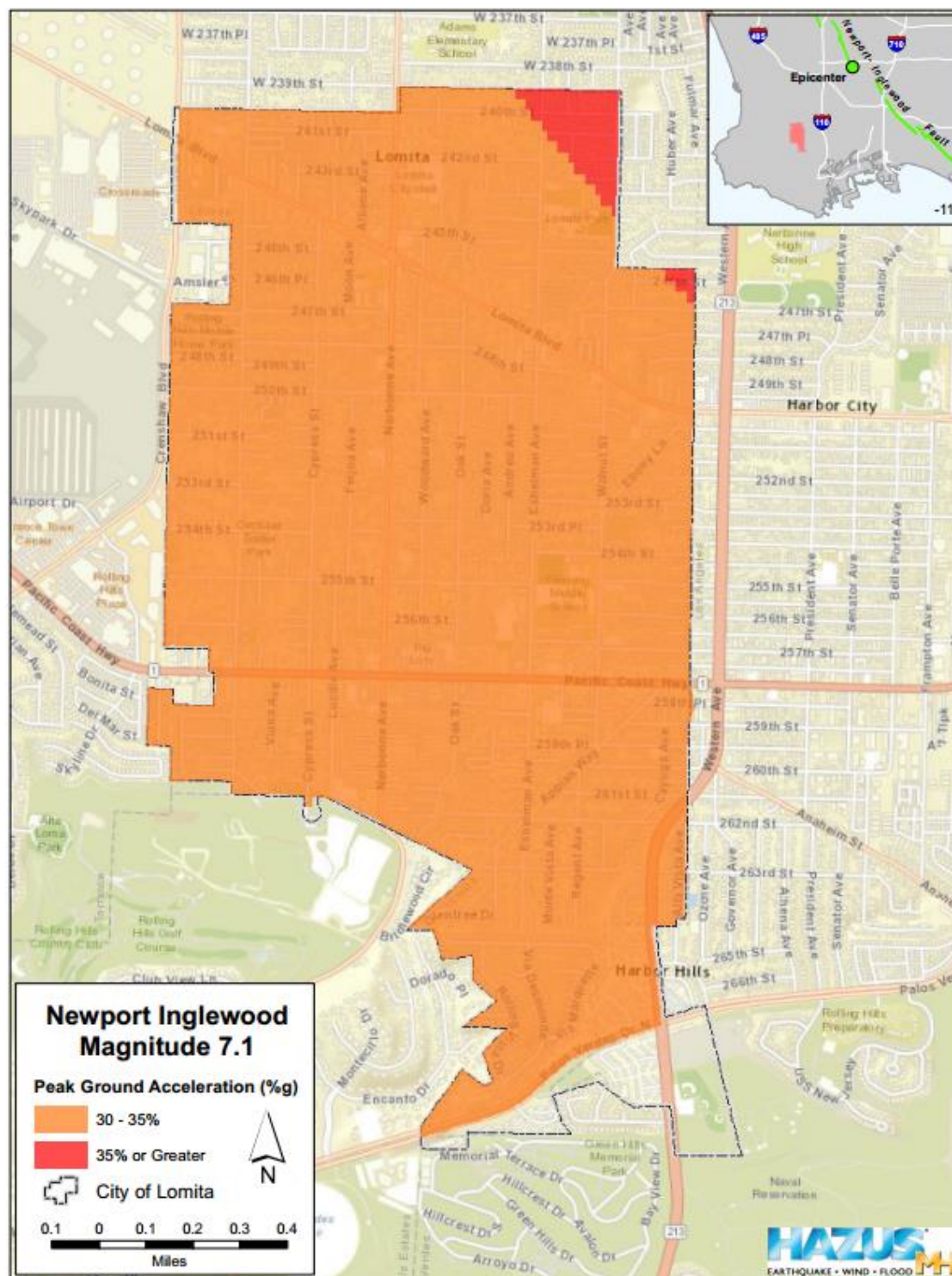
System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	\$60,263,300	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
Railways	Segments	\$0	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Light Rail	Segments	\$0	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Bus	Facilities	\$0	\$0	0%
Ferry	Facilities	\$0	\$0	0%
Port	Facilities	\$0	\$0	0%
Airport	Facilities	\$0	\$0	0%
TOTAL		\$60,263,300	\$0	



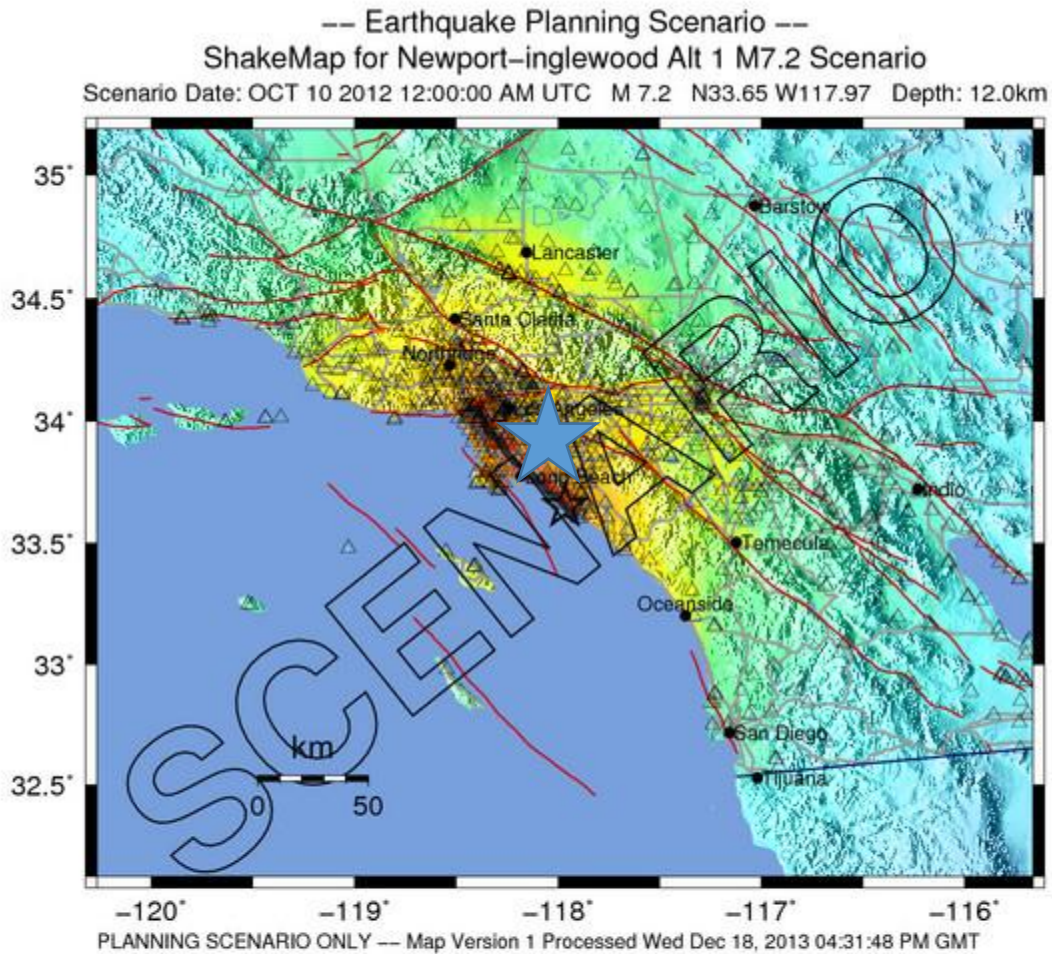
Table: Utility System Economic Losses (\$ Dollars) – Newport-Inglewood M7.1

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$14,863,300	\$330,800	2%
Waste Water	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$8,918,000	\$237,100	3%
Natural Gas	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$5,945,300	\$68,000	1%
Oil Systems	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Electrical Power	Facilities	\$0	\$0	0%
Communication	Facilities	\$0	\$0	0%
TOTAL		\$29,726,600	\$635,900	

Map: Shake Intensity Map – Newport-Inglewood M7.1
(Source: Emergency Planning Consultants)



Map: Seismic Shaking Intensities for the Newport-Inglewood M6.9
(Source: State of California Department of Conservation)
(Location of Lomita shown with Blue Star)



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)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL. (cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al., 1999



Palos Verdes M7.3 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – Palos Verdes M7.3

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	2	4	5	3	2
Commercial	33	65	117	87	45
Education	2	4	4	2	1
Government	1	1	1	1	1
Industrial	8	17	34	27	15
Other Residential	60	139	239	274	186
Religion	5	8	11	8	4
Single Family	1,082	2,128	1,454	198	58
Total	1,193	2,365	1,866	599	312

Table: Expected Building Damage by Building Type – Palos Verdes M7.3

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	1,141	2,252	1,540	206	62
Steel	8	15	38	34	18
Concrete	11	22	32	24	13
Precast	6	14	34	29	16
RM	22	29	58	48	18
URM	1	3	9	9	9
MH	4	31	154	249	176
Total	1,193	2,365	1,866	599	312



Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Palos Verdes M7.3

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	743	370	92
Waste Water	446	265	66
Natural Gas	297	76	19
Oil	0	0	0

Table: Expected Potable Water and Electric Power System Performance – Palos Verdes M7.3

	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	7,869	3,575	345	0	0	0
Electric Power		6,539	4,388	2,108	476	8

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 488 households to be displaced due to the earthquake. Of these, 291 people (out of a total population of 19,759) will seek temporary shelter in public shelters.



Casualties

The table below represents a summary of casualties estimated for the Palos Verdes M7.3 earthquake scenario.

Table: Casualty Estimates – Palos Verdes M7.3

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	2	1	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	3	1	0	0
	Other-Residential	46	11	1	2
	Single-Family	29	5	0	0
	TOTAL	80	17	2	3
2PM	Commercial	122	35	6	11
	Commuting	0	0	0	0
	Educational	35	10	2	3
	Hotels	0	0	0	0
	Industrial	23	6	1	2
	Other-Residential	9	2	0	0
	Single-Family	6	1	0	0
	TOTAL	194	55	9	17
5PM	Commercial	85	24	4	8
	Commuting	0	0	0	0
	Educational	3	1	0	0
	Hotels	0	0	0	0
	Industrial	14	4	1	1
	Other-Residential	17	4	0	1
	Single-Family	11	2	0	0
	TOTAL	131	35	5	10



Economic Losses

The total economic loss estimated for the Palos Verdes M7.3 scenario earthquake is \$406.95 million dollars which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Building-Related Economic Losses (\$ Dollars) – Palos Verdes M7.3

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	\$0	\$890,300	\$9,487,400	\$197,500	\$510,800	\$11,086,000
	Capital-Related	\$0	\$380,800	\$8,480,700	\$112,900	\$121,800	\$9,096,200
	Rental	\$2,568,600	\$4,457,500	\$4,476,600	\$55,200	\$241,100	\$11,799,000
	Relocation	\$9,848,500	\$4,425,200	\$6,441,500	\$318,400	\$1,963,800	\$22,997,400
	Subtotal	\$12,417,100	\$10,153,800	\$28,886,200	\$684,000	\$2,837,500	\$54,978,600
Capital Stock Losses	Structural	\$20,024,800	\$10,993,100	\$12,260,200	\$1,655,400	\$2,947,500	\$47,881,000
	Non-Structural	\$102,053,500	\$62,865,100	\$41,640,000	\$6,241,600	\$9,594,100	\$222,394,300
	Content	\$33,970,700	\$15,508,500	\$19,398,400	\$3,880,200	\$4,665,200	\$77,423,000
	Inventory	\$0	\$0	\$411,900	\$618,400	\$45,200	\$1,075,500
	Subtotal	\$156,049,000	\$89,366,700	\$73,710,500	\$12,395,600	\$17,252,000	\$348,773,800
TOTAL		\$168,466,100	\$99,520,500	\$102,596,700	\$13,079,600	\$20,089,500	\$403,752,400



Table: Transportation System Economic Losses (\$ Dollars) – Palos Verdes M7.3

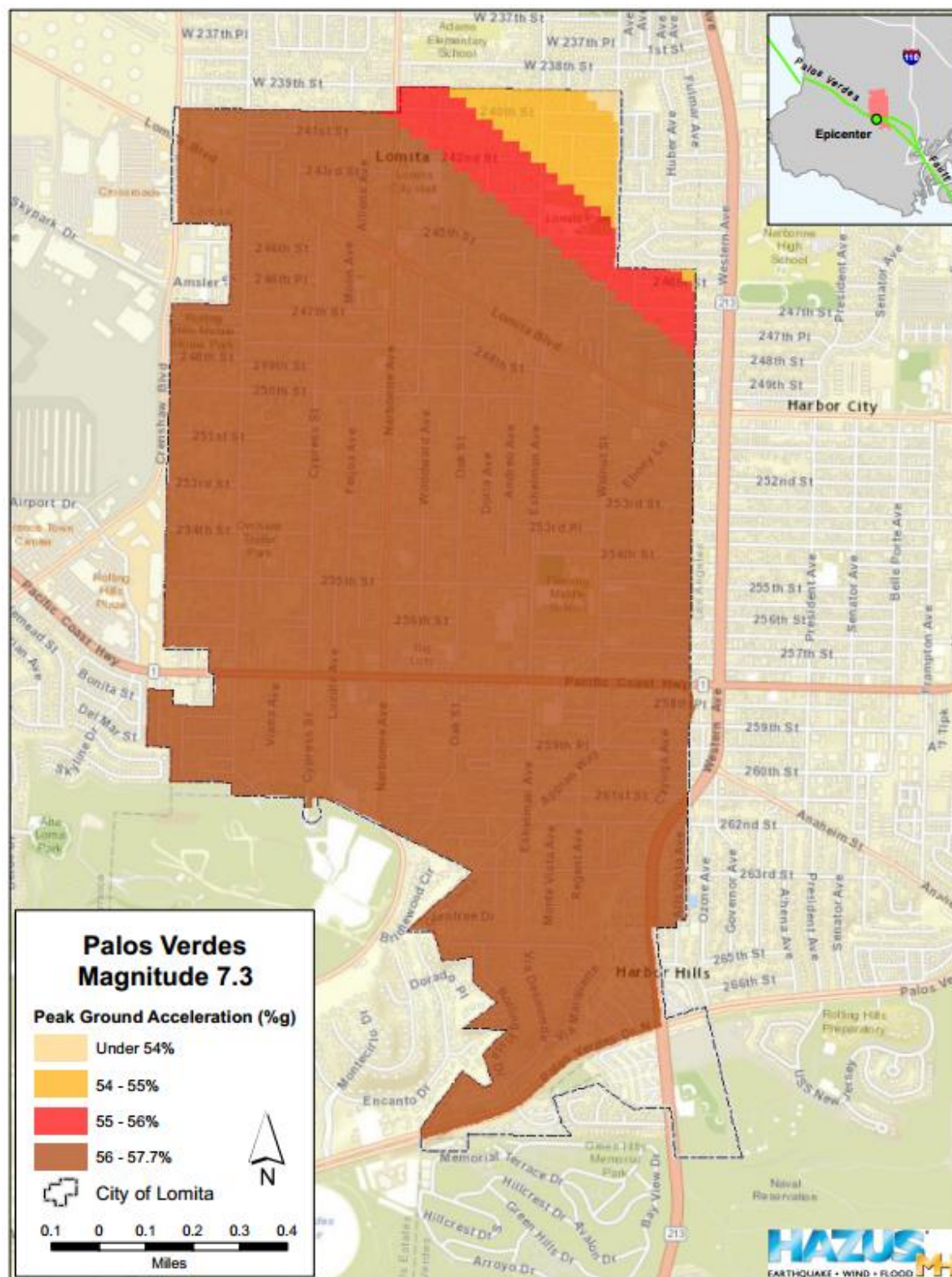
System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	\$60,263,300	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
Railways	Segments	\$0	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Light Rail	Segments	\$0	\$0	0%
	Bridges	\$0	\$0	0%
	Tunnels	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Bus	Facilities	\$0	\$0	0%
Ferry	Facilities	\$0	\$0	0%
Port	Facilities	\$0	\$0	0%
Airport	Facilities	\$0	\$0	0%
TOTAL		\$60,263,300	\$0	



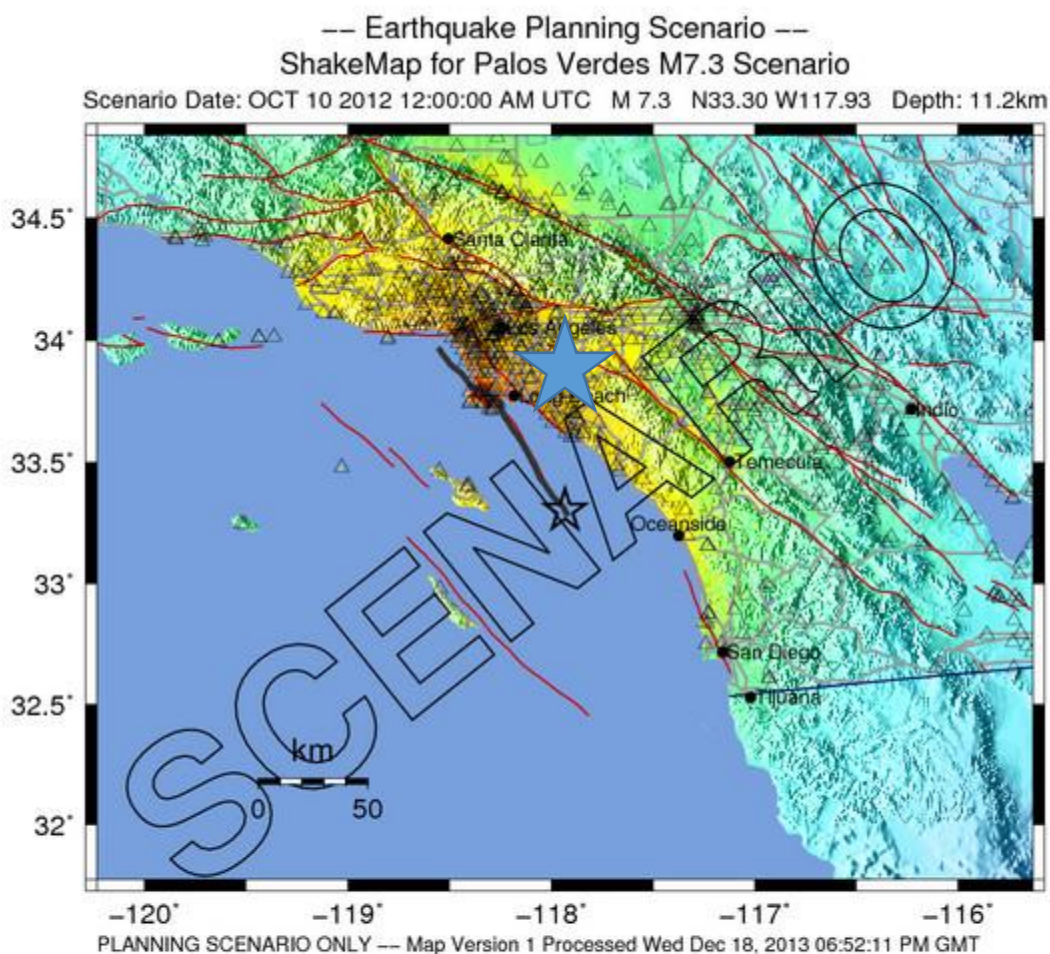
Table: Utility System Economic Losses (\$ Dollars) – Palos Verdes M7.3

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$14,863,300	\$1,663,200	11%
Waste Water	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$8,918,000	\$1,192,000	13%
Natural Gas	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
	Distribution Lines	\$5,945,300	\$341,900	6%
Oil Systems	Pipelines	\$0	\$0	0%
	Facilities	\$0	\$0	0%
Electrical Power	Facilities	\$0	\$0	0%
Communication	Facilities	\$0	\$0	0%
TOTAL		\$29,726,600	\$3,197,100	

Map: Shake Intensity Map – Palos Verdes M7.3
(Source: Emergency Planning Consultants)



Map: Seismic Shaking Intensities for the Palos Verdes M7.1
(Source: State of California Department of Conservation)

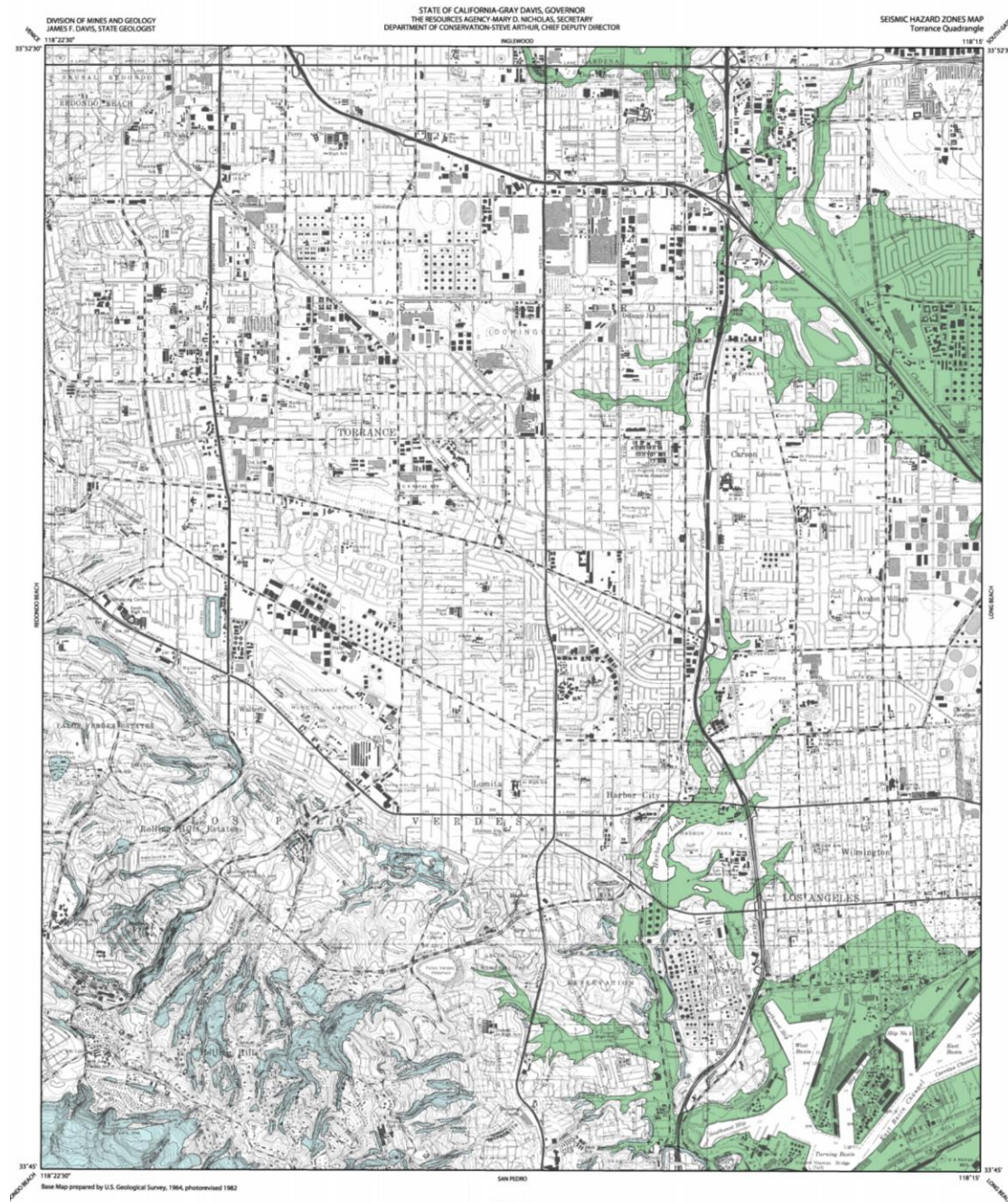


PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999



Map: Landslide and Liquefaction Zones in Lomita (Source: California Department of Conservation)



PURPOSE OF MAP

This map will assist cities and counties in fulfilling their responsibilities for protecting the public safety from the effects of earthquake triggered ground failure as required by the Seismic Hazards Mapping Act (Public Resources Code Sections 26950-26994.6).

For information regarding the scope and recommended methods to be used in conducting the required site investigations, see DMC Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California.

For a general description of the Seismic Hazards Mapping Program, the Seismic Hazards Mapping Act and regulations, and related information, please refer to the draft User's Guide (see <http://www.conservation.ca.gov/dmg/sheep/ueguide/>).

Production of this map was funded by the Federal Emergency Management Agency's Hazard Mitigation Program and the Department of Conservation in cooperation with the Governor's Office of Emergency Services.

IMPORTANT - PLEASE NOTE

1) This map may not show all areas that have the potential for liquefaction, landslides, strong earthquake ground shaking or other earthquake and geologic hazards. Also, a single earthquake capable of causing liquefaction or triggering landslides before will not uniformly affect the entire area shown.

2) Liquefaction zones may also contain areas susceptible to the effects of earthquake induced landslides. This situation typically exists at or near the toe of existing landslides.

SCALE 1:24,000

STATE OF CALIFORNIA SEISMIC HAZARD ZONES

Delimited in compliance with
Chapter 7.8, Division 3 of the California Public Resources Code
(Seismic Hazards Mapping Act)

MAP EXPLANATION

Zones of Required Investigation:

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 26993(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 26993(c) would be required.



Structures and Building Code

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk, and the cost to clean up the damages is great. In most California communities, including the City of Lomita, many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings (URM). There are 15 URM buildings within the City have been identified for upgrade in order to meet current requirements.

Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Lomita contracts with Los Angeles County Building & Safety Department to enforce building codes including those pertaining to earthquake hazards.

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

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



Flood Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Flooding in the City of Lomita** below

Previous Occurrences of Flooding in the City of Lomita

The most recent storm event resulting in localized flooding took place in April 2016. The storm was accompanied with severe winds which resulted in property damages. See the Windstorm Hazards Section for additional information.

In general, according to the Planning Team, since construction of the storm drain system several decades ago, flooding has not posed a serious threat to Lomita. According to FEMA Flood Insurance Rate Maps, Lomita does not lie within a 100- or 500- year floodplain. However, the potential for localized flooding still exists (see Local Conditions below).

Previous Occurrences of Flooding in Los Angeles County

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

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

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

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



Local Conditions

According to the City's General Plan, most potential flooding problems in the City are related to the inadequacy of the existing drainage devices. Due to increased urbanization and increased runoff, the existing storm drainage is presently inadequate to channel runoff from a 100-year storm. Ponding behind inadequate culverts, catch basins, curbs and gutters could result in inundation of private properties. Specific storm drain deficiencies that exist in the City of Lomita are located as follows:

- Eshelman Ave./262nd Street/Appian Way
- Pennsylvania Avenue from approximately 251st to 254th Street
- Western terminus of 256th Street
- Lomita Blvd and Pennsylvania

Q&A | ELEMENT C. MITIGATION STRATEGY | C2

Q: C2. 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 **National Flood Insurance Program** below.

National Flood Insurance Program

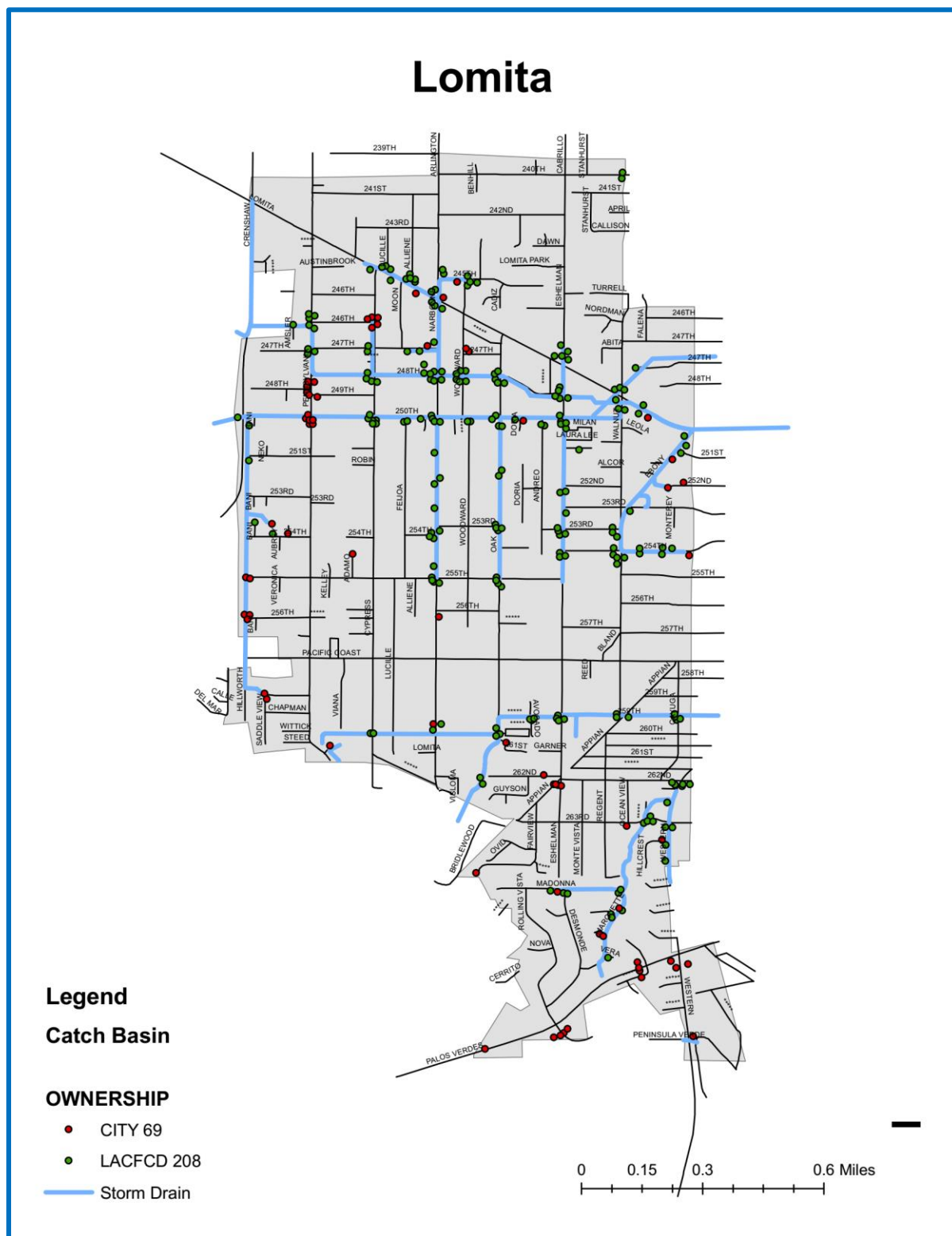
The City participates in the National Flood Insurance Program (NFIP). Created by Congress in 1968, the NFIP makes flood insurance available in communities that enact minimum floodplain management rules consistent with the Code of Federal Regulations §60.3.

According to **Map: Flood Insurance Rate Map**, the City is designated as "Flood Zone X". Zone X is defined as the area outside the 100-year and 500-year flood areas.





Map: Storm Drain Locations
(Source: City of Lomita Public Works Department)





Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Flooding in the City of Lomita** below

Impact of Flooding in the City of Lomita

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

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

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

Note: also refer to the Risk Assessment Section for two tables that define the vulnerability of Lomita to hazards:

Table: Critical and Essential Facilities Vulnerable to Hazards

Table: Location of Land Uses by Hazard



Windstorm Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

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

Previous Occurrences of Windstorms in the City of Lomita

Lomita was most recently impacted by severe windstorms in April 2016 when a large winter windstorm caused several reports of damage including fallen branches, debris, and uprooted trees. Sporadic power outages were also commonplace.

Severe windstorms pose a significant risk to life and property in Lomita by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can result in physical damage to local homes and businesses. High winds can also have destructive impact to nature and infrastructure, especially trees and power lines.

Based on local history, most incidents of high wind in the City of Lomita are the result of the either Santa Ana winds or off-shore conditions.

Local Conditions

Historically within the region, high wind conditions have caused injury, death, property damage, and fanned wildfires. Windstorms with significant intensity have been responsible for the sinking of watercraft and the downing of aircraft resulting in the loss of life. Santa Ana winds have exceeded 100 mph in regional locations. Such high wind events have resulted in temporary closure of highways (I-15 and 215). Fortunately, the City is not located near passes where the highest velocities are generated.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impacts of Windstorms in the City of Lomita** below

Impacts of Windstorms in the City of Lomita

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

Impacts that can be anticipated in future include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure



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



Drought Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See below

Previous Occurrences of Drought in the City of Lomita

The 2004 Mitigation Plan did not identify drought as a significant hazard since there is no severe history of drought within the City of Lomita. Although those conditions have not changed, the Governor of California declared a Drought State of Emergency on January 17, 2014. On April 1, 2015, the Governor issued an Executive Order mandating water reductions throughout California.

In light of the possibility that impacts to Lomita could increase in significance, the Planning Team decided to add “drought” as a hazard to the update of the 2016 Plan. City leaders have also taken action to face the possibility of a continuing or worsening drought. The Drought Management Plan Ordinance was passed in 2009, which outlines three response levels through which the City can react to drought with additional water use restrictions and conservation measures. In response to the current statewide drought, the City declared a Drought Response Level 1 on May 12, 2015 in accordance with the Drought Management Plan.

Previous Occurrences of Drought in Los Angeles County

The region’s Mediterranean climate makes it especially susceptible to variations in rainfall. Though the potential risk to the City of Lomita is in no way unique, severe water shortages could have a bearing on the economic well-being of the community. Comparison of climate (rainfall) records from Los Angeles with water well records beginning in 1930 from the San Gabriel Valley indicates the existence of wet and dry cycles on a 10-year scale as well as for much longer periods. The climate record for the Los Angeles region beginning in 1890 suggests drying conditions over the last century. With respect to the present day, climate data also suggests that the last significant wet period was the 1940s. Well level data and other sources seem to indicate the historic high groundwater levels (reflecting recharge from rainfall) occurred in the same decade. Since that time, rainfall (and groundwater level trends) appears to be in decline. This slight declining trend, however, is not believed to be significant. Climatologists compiled rainfall data from 96 stations in the State that spanned a 100-year period between 1890 and 1990. An interesting note is that during the first 50 years of the reporting period, there was only one year (1890) that had more than 35 inches of rainfall, whereas the second 50-year period recording of 5 year intervals (1941, 1958, 1978, 1982, and 1983) that exceeded 35 inches of rainfall in a single year. The year of maximum rainfall was 1890 when the average annual rainfall was 43.11 inches. The second wettest year on record occurred in 1983 when the State’s average was 42.75 inches.

The driest year of the 100-year reported in the study was 1924 when the State’s average rainfall was only 10.50 inches. The region with the most stations reporting the driest year in 1924 was the San Francisco Bay area. The second driest year was 1977 when the average was 11.57 inches. The most recent major drought (1987 to 1990) occurred at the end of a sequence of



very wet years (1978 to 1983). The debate continues on the degree to which global climate change will have an effect on local micro-climates. The semi-arid southwest is particularly susceptible to variations in rainfall. A study that documented annual precipitation for California since 1600 from reconstructed tree ring data indicates that there was a prolonged dry spell from about 1755 to 1820 in California. Fluctuations in precipitation could contribute indirectly to a number of hazards including wildfire and the availability of water supplies.

Local Conditions

According to the City of Lomita Urban Water Management Plan (2015), prior to the City's incorporation in 1964, the water system was owned and operated by the Los Angeles County Waterworks District No. 13 (District). The District was initially granted a water supply permit in August 1954. At that time, water was supplied by several wells, and a Metropolitan Water District 12-inch connection for imported water.

In 1990, ownership of the water system was transferred to the City. Since then, the City has handled the operations, maintenance, and upgrading of the system. The District was retained as a contractor primarily to work on the water quality monitoring, which includes collections, sampling, analyses, and production of the annual water quality report; the written correspondence between the system and the regulatory agencies; and meter protection.

The City's Water Division performs most maintenance activities such as new installations, pipeline repair and flushing, valve exercising, and telemetry. The Lomita City Council governs the City Water Division.

A significant drought hit the State of California back in 2011. The drought has depleted reservoir levels all across the state. In January of 2014, Governor Brown declared a state of emergency and directed state officials to take all necessary actions to prepare for water shortages. As the drought prolonged into 2015, to help cope with the drought, Governor Brown gave an executive order in April 2015 which mandated a statewide 25 percent reduction in water use. In January of 2016, the DWR and the U.S. Bureau of Reclamation have finalized the 2016 Drought Contingency Plan that outlines State Water Project and Central Valley Project operations for February 2016 to November 2016. The plan was developed in coordination with staff from State and federal agencies. Although the drought has more significantly impacted surfaces waters and other agencies that use water for agriculture, the City of Lomita is still affected by the drought, primarily due to reduced reliability of imported water.



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impacts of Drought in the City of Lomita** below

Impacts of Drought in the City of Lomita

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

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

- ✓ Injury and loss of life
- ✓ Disruption of and damage to public infrastructure
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Uncontrolled fires and associated injuries and damage



PART III: MITIGATION STRATEGIES

Mitigation Strategies

Overview of Mitigation Strategy

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

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

The resources and information within the Mitigation Plan:

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

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

Mitigation Measure Categories

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

- ✓ **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- ✓ **Property Protection:** Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- ✓ **Public Education and Awareness:** Actions to inform and educate citizens, property owners, and elected officials about hazards and potential ways to mitigate them.



Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- ✓ **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses preserve or restore the functions of natural systems. Examples include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- ✓ **Emergency Services:** Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- ✓ **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.

Q&A | ELEMENT C. MITIGATION STRATEGY | C3

Q: C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))

A: See below.

Goals

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

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

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

The five mitigation goals and descriptions are listed below.

Protect Life and Property

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

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

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

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



Enhance Public Awareness

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

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

Preserve Natural Systems

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

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

Encourage Partnerships and Implementation

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

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

Strengthen Emergency Services

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

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

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

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

How are the Mitigation Action Items Organized?

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

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

Funding Source

The action items can be funded through a variety of sources, possibly including: operating budget/general fund, development fees, Community Development Block Grant (CDBG), Hazard



Mitigation Grant Program (HMGP), other Grants, private funding, Capital Improvement Plan, and other funding opportunities.

Coordinating Organization

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

Plan Goals Addressed

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

The plan goals are organized into the following five areas:

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

Building and Infrastructure

This addresses the issue of whether or not a particular action item results in the reduction of the effects of hazards on new and existing buildings and infrastructure.

Comments

The purpose of the “Comments” is to capture the notes and status of the various action items. Since Planning Team members frequently change between plan updates and annual reviews, the Comments provide a sort of history to help in tracking the progress and status of each action. Comments are expressed in terms of Completed, Revised, Deleted, New, Deferred, and Notes.

Planning Mechanism

It's important that each action item be implemented. Perhaps the best way to ensure implementation is through integration with one or many of the City's existing “planning mechanisms” including the General Plan, Capital Improvement Program, General Fund and Grants. Opportunities for integration will be simple and easy in cases where the action item is already compatible with the content of the planning mechanism. As an example, if the action item calls for the creation of a floodplain ordinance and the same action is already identified in the General Plan's policies, then the General Plan will assist in implementation. On the



contrary, if preparation of a floodplain ordinance is not already included in the General Plan policies then the item will need to be added during the next update to the General Plan. The next General Plan update will likely not take place for another 20 years.

The Capital Improvement Program, depending on the budgetary environment, is updated every 5 years. The CIP includes infrastructure projects built and owned by the City of Lomita. As such, the CIP is an excellent medium for funding and implementing action items from the Mitigation Plan. The Mitigation Actions Matrix includes several items from the existing CIP. The authors of the CIP served on the Planning Team and are already looking to funding addition Mitigation Plan action items in future CIPs.

The General Fund is the budget document that guides all of the City's expenditures and is updated on an annual basis. Although primarily a funding mechanism, it also includes descriptions and details associated with tasks and projects.

Grants come from a wide variety of sources – some annually and other triggered by events like disasters. Whatever the source, the City uses the General Fund to identify successful grants as funding sources.

Q&A | ELEMENT C. MITIGATION STRATEGY | C5

Q: C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Benefit/Cost and Priority Ratings** 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 funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).

Medium: The project could be implemented with existing funding but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.

Low: The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.



Benefit ratings were defined as follows:

High: Project will provide an immediate reduction of risk exposure for life and property.

Medium: Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.

Low: Long-term benefits of the project are difficult to quantify in the short term.

Ranking Priorities

To assist with implementing the Hazard Mitigation Plan the Planning Team adopted the following process for establishing an overall ranking for each of the mitigation action items. Designations of “High”, “Medium”, and “Low” priority have been assigned to each action item using the following tool:

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?

During the prioritization meeting of the Planning Team, department 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 | C1

Q: C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

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

Q&A | ELEMENT C. MITIGATION STRATEGY | C4

Q: C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

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

Q&A | ELEMENT C. MITIGATION STRATEGY | C5

Q: C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

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

Q&A | ELEMENT D. MITIGATION STRATEGY | D2

Q: D2. 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: D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))

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



Mitigation Actions Matrix

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

Table: Mitigation Actions Matrix

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
MULTI-HAZARD ACTION ITEMS														
MH-1 Integrate the goals and action items from the City of Lomita Natural Hazard Mitigation Plan into existing regulatory documents and programs, where	Hazard Mitigation Steering Committee	Ongoing					X	GF	GP, CIP, GF	H	L	H	Revised funding, planning, and benefit/cost	



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
appropriate.														
MH-2 Identify and pursue funding opportunities to develop and implement City mitigation activities.	City Administration, Steering Committee	Ongoing					X	GF	CIP	M	L	M	Revised funding, planning, and benefit/cost	
MH-3 Establish a formal role for the City of Lomita Natural Hazards Mitigation Steering Committee to develop a sustainable process for	Hazard Mitigation Steering Committee	Ongoing					X	GF	GF	H	L	H	Revised funding, planning, and benefit/cost	

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
implementing, monitoring, and evaluating City mitigation activities.														
MH-4 Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in the City of Lomita.	Hazard Mitigation Steering Committee	Ongoing					X			M			Deleted	
MH-4 Identify and partner with	Hazard Mitigation	Ongoing		X			X	GF	GF	M	L	M	Revised action item, goals,	

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
organizations within the City of Lomita that have programs or interests in natural hazards mitigation to increase public awareness of hazard mitigation.	Steering Committee												funding, planning, benefit/cost	
MH-5 Develop inventories of at-risk City buildings and facilities and prioritize mitigation projects that will reduce risk,	Public Works Department	2-4 years	X							M /L			Deleted - redundant	

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
facilitate recovery and resumption to prevent the loss of City funding.														
MH-5 Enhance community education by linking emergency services preparedness with natural hazard mitigation programs.	City Administration, Steering Committee	Ongoing				X		GF	GF	M /L	L	M	Revised action item, funding, planning, benefit/cost	
MH-6 Coordinate with neighboring jurisdictions to	Public Works Department	Ongoing	X			X		GF/GR	CIP	M /L	H	M	Revised action item.	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
monitor the status of their respective infrastructures that could potentially impact the City, such as storm drain systems and emergency transportation routes.														
MH-7 Continue to maintain City street trees to minimize potential of falling limbs, including removal of	Public Works Department	Ongoing	X					GF	GF	H	L	H	Revised action item. Note: the City has successfully implemented an ongoing maintenance	

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
diseases trees.													schedule for all City trees and also responds to citizen concerns regarding diseased trees when necessary.	
MH-8 Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to employees	Hazard Mitigation Steering Committee	Ongoing	X	X					GF	M	L	M	Revised funding, benefit/cost	

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
and citizens residing near or within the City.														
MH-9 Make the City of Lomita Natural Hazards Mitigation Plan available to the public by publishing the plan electronically on the City web site.	Hazard Mitigation Steering Committee	Ongoing	X	X						M	L	H	Revised benefit/cost	
MH-10 Develop and implement disaster response training for all employees which	City Administration, Steering Committee	Ongoing	X	X				GF	GF	H	L	M	Revised action item. Note: the City requires all full time employees to	



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
includes a hazard mitigation component.													be CERT trained which includes information on mitigating hazards within the home and workplace.	
MH-10 Complete all work needed/listed in the City's Capital Improvement Plan that reduces hazards to employees and protects facilities.	Hazard Mitigation Steering Committee	Ongoing	X							M			Deleted - Replaced with specific projects from the CIP	
MH-11 Utilize	Safety	Ongoing		X				GF	GF	M	L	M	Moved from	

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
staff meetings and the employee newsletter to inform staff about Hazard Mitigation activities.	Committee, City Administration												EQ action items. Added benefit/cost	
MH-12 Provide all Area G cities with access to the City's Hazard Mitigation plan.	Steering Committee	1 year					X	GF	GF	M	L	M	Moved from EQ action items. Added benefit/cost	
MH-13 Installation of an Emergency Power Generator-City Hall.*	City Administration, Public Works Department	1-2 years				X		GF/GR	CIP	H	L	H	New action item	Y
MH-14 Water Meter	Public Works Department	1-2 years	X			X		WF	CIP	H	L	H	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
Replacement-Phase 2.*														
MH-15 Installation of an Emergency Power Generator-Lomita Park.*	Parks & Recreation Department	2-5 years				X		UK	CIP	H	M	H	New action item	Y
MH-16 Water and Street Improvement-Walnut St from Ebony Ln to Pacific Coast Highway.*	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y
MH-17 Disaster Recovery Alternative Site Location.*	General Administration	2-5 years				X		UK	CIP	H	H	H	New action item	



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
MH-18 Water and Street Improvement-248th St from East City Limit to End.*	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y
MH-19 Water and Street Improvement-246th St from Falena Ave to East City Limit.*	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y
MH-20 Water and Street Improvement-247th PI from East City Limit to End.*	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
MH-21 Water and Street Improvement-Eshelman Ave from Garner St to 262nd Street.*	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y
MH-22 Water and Street Improvement-Forrester Dr. (Alley) West of Cypress Street.*	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y
MH-23 Water and Street Improvement-250th Street from Eshelman Avenue to West	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
End.*														
* Additional details on this project are available in the 2014-2019 City of Lomita Capital Improvement Plan.														
MH-24 Replace 2" water pipes throughout the Lomita Water System to eliminate dead end pipes, improve water circulation, and reduce risk of breaks and leaks. (2015 Water Master Plan, Priority #1) Length of pipe to be replaced:	Public Works Department	1-2 years	X			X		WF	CIP	H	M	H	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
1,701 feet Total cost: Approx. \$221,130.**														
MH-25 Replace all 1928 or earlier built pipelines that will improve fire flow conditions and reduce risk of breaks and leaks (2015 Water Master Plan, Priority #2). Length of pipe to be replaced: 11,595 feet	Public Works Department	2-5 years	X			X		UK	CIP	H	H	H	New action item	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
Total cost: Approx. \$1,542,440.**														
MH-26 Replace all remaining 1928 or earlier built pipelines regardless of their impact on the fire flow requirement. The City believes the risk of failure for these old pipelines is high and if they fail, they will substantially	Public Works Department	5-10 years	X			X		UK	CIP	H	H	H	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
impact the fire flow and the fire flow conditions will change from low to very poor. (2015 Water Master Plan, Priority #3) Length of pipe to be replaced: 23,147 feet Total cost: Approx. \$3,482,500.**														
MH-27 Replace all remaining pipes as required	Public Works Department	10+ years	X			X		UK	CIP	H	H	H	New action item	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
to meet the fire flow conditions. (2015 Water Master Plan, Priority #4) Length of pipe to be replaced: 9,605 feet Total cost: Approx. \$1,283,860.**														
MH-28 Install fire suppression sprinkler system in City Hall.	Facilities Maintenance Division	5-10 years	X			X		UK	CIP	H	H	M	New Action Item	Y
MH-29 Install specialized fire suppression	Facilities Maintenance Division	5-10 years	X			X		UK	CIP	H	H	M	New Action Item	Y



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system in City Hall IT/server room.														
** Additional details on this project are available in the 2015 City of Lomita Water Master Plan. Also, although only the priority projects have been specifically identified in the Mitigation Actions Matrix, it is the intention of the City to include by reference all of the projects included in the 2015 Water Plan.														
EARTHQUAKE ACTION ITEMS														
EQ-1 Continue to improve internal facility non-structural resistance to damage and injury due to earthquakes. Non-structural components include	Parks & Recreation Department; Maintenance Division	1-5 years	X					GF	GF	M	L	M	Revised – assignment, timeline, funding, planning, benefit/cost. Note: Maintenance Division has ensured that storage for	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
furnishings, equipment, electrical and mechanical fixtures, and architectural features such as partitions, cabinets, and shelves.													hazardous materials is secure.	
EQ-2 Continue to work with the property owners of the unreinforced masonry structures on bringing the	Community Development Department	1 year	X	X		X	X	GF	GF	H	L	M	New action item	Y

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structures into compliance with existing building codes.														
EQ-3 Conduct a seismic and structural inventory of all City facilities.	Facilities Maintenance Division	2-5 years	X	X		X	X	UK	CIP	H	M	M	New action item	Y
EQ-4 Encourage of use of earthquake braces and straps in homes and businesses.	City Manager's Office	1-2 years	X	X		X	X	GF	GF	M	L	M	New action item	Y
EQ- Provide adoption of policies or													Deleted	



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
practices going to mitigating effects of hazards.														
EQ- Utilize staff meetings as avenues for informing staff on hazard Mitigation and Disaster Preparedness.													Deleted	
EQ- Develop alternative means to educate the community on Hazard Mitigation and Disaster Preparedness in which the City of													Deleted	



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
Lomita serves.														
EQ Assess the readiness of the City to survive a disaster.													Deleted	
EQ Share all plans related to Disaster Response.													Deleted	
EQ Deepen the City's commitment to communication with local communities.													Deleted	
EQ Understand what assistance may be available													Deleted	



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
from local public agencies in preventing or limiting water damage to City facilities.														
WINDSTORM ACTION ITEMS														
WND- Reduce the hazard of falling trees and tree limbs during high wind conditions.													Deleted	
WND-1 Increase efforts to minimize potential of damages to	Public Works Department	1-5 years	X					GF	GF	H	L	H	Revised action item. Note: the City has successfully implemented	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
people and property resulting from falling trees and limbs. This program should prioritize removal of diseased trees.													an ongoing maintenance schedule for all City trees and also responds to citizen concerns regarding diseased trees when necessary.	
WND-2 Prepare public awareness materials to encourage home and business owners to protect their properties	Public Information Officer	1 year	X	X		X	X	GF	GF	H	L	H	New action item.	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
against strong winds. Materials could include roof strengthening and trimming of nearby trees.														
WND-3 Protect power lines and infrastructure by establishing standards for all utilities regarding tree pruning around lines.	Public Works Department	1-5 years	X					GF	GF	H	M	H	New	Y
WND-4 Incorporate inspection and management of	Public Works Department	1-5 years	X					GF	GF	H	M	H	New	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
hazardous trees into the drainage system maintenance process.														
FLOOD ACTION ITEMS														
FLD- Ensure that areas susceptible to flooding on City property are addressed to reduce or eliminate the hazard that exists.													Deleted	
FLD-1 Conduct a study of localized flooding hazards	Public Works Department	Done	X					GF	GF	M	L	M	Storm Drain Study was completed in	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
and identify needed improvements.													2008.	
FLD-2 Coordinate with LA County to ensure that all storm drains in the City are maintained and cleaned out.	Public Works Department	Ongoing	X					GF	GF	M	L	M	Note: City coordinated with LA County to clean/maintain storm drains prior to most recent El Nino event in Winter 2015/Spring 2016.	Y
FLD-3 Construct 750 ft. of 36" RCP lateral from 262 nd St at	Public Works Department	10+ years	X					UK	CIP	L	H	L	New action item	Y

Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
Eshelman Ave. to 259 th Pl.														
FLD-4 Construct 300 ft. of 72" RCP as detention facility for 256 th St; reconstruct street to include gutter down middle of street with grating catch basins.	Public Works Department	10+ years	X					UK	CIP	M	H	L	New action item	Y
FLD-5 Construct 1,000 ft. of 24" RCP with catch basins in area of Pennsylvania	Public Works Department	10+ years	X					UK	CIP	M	H	M	New action item	Y



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Ave. and 253 rd St.														
FLD-6 Construct 800 ft. of 24" RCP in area of Lomita Blvd. and Pennsylvania Ave.	Public Works Department	10+ years	X					UK	CIP	M	H	M	New action item	Y
DROUGHT ACTION ITEMS														
DR-1 Connect Lomita Water System Pressure Zone 2 to the Cypress Water Production Facility (CWPF) to allow for distribution of groundwater to	Public Works Department	2-5 years	X		X			UK	CIP	M	H	M	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
Zone 2 and reduce reliance on imported water.														
DR-2 Connect Lomita Water System Pressure Zone 3 to the CWPF to allow for distribution of groundwater to Zone 2 and reduce reliance on imported water.	Public Works Department	5-10 years	X		X			UK	CIP	M	H	M	New action item	Y
DR-3 Complete upgrades to the CWPF, including	Public Works Department	2-5 years	X		X			UK	CIP	M	H	M	New action item	Y



Identifier and Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Funding Source: GF- General Fund, WF-Water Fund, GR-Grant, WF-Water Fund, UK-Unknown	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2018 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)
new equipment that allow for the increased use of groundwater and reduce reliance on imported water.														



Plan Maintenance

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

Q&A | ELEMENT A: PLANNING PROCESS | A6

Q: A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

A: See **Method and Scheduling of Plan Implementation** below.

Method and Scheduling of Plan Implementation

The Planning Team that was involved in research and writing of the Plan will also be responsible for implementation. The Planning Team will be led by the Chair of the Planning Team (Laura Vander Neut - Management Analyst / Emergency Services Coordinator) and will be referred to as the “Local Mitigation Officer”. The Local Mitigation Officer will lead the Planning Team in an effort to monitor, evaluate, and update the plan on a yearly basis.

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

Monitoring and Implementing the Plan

Plan Adoption

Adoption of the Mitigation Plan by the City’s governing body is one of the prime requirements for approval of the plan. Once the plan is completed, the City Council will be responsible for adopting the Mitigation Plan. The governing body has the responsibility and authority to promote sound public policy regarding hazards. The local agency governing body will have the authority to periodically update the plan as it is revised to meet changes in the hazard risks and exposures in the City. The approved Mitigation Plan will be significant in the future growth and development of the City.

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



Local Mitigation Officer

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

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

The Planning Team will meet 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.

Q&A | ELEMENT C. MITIGATION STRATEGY | C6

Q: C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))

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

Implementation through Existing Programs

The City of Lomita addresses statewide planning goals and legislative requirements through its existing programs and procedures including the General Plan, Capital Improvement Program, Zoning Ordinance, and Building and Safety Codes. The Mitigation Plan provides hazard information and a series of recommendations - many of which are closely related to the goals and objectives of other existing programs and procedures. The City of Lomita will incorporate hazard information and implement recommended mitigation action items through the existing programs and procedures. Specific examples are provided below.

The City of Lomita contracts with Los Angeles County Building and Safety to be responsible for adhering to the State of California's Building and Safety Codes. In addition, the Planning Team will work with other agencies at the state level to review, develop and ensure 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 CIP. Various City departments develop the CIP and review it on an annual basis. Upon annual review of the CIP, the Planning Team will work with the City departments to identify areas that the Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

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 Plan, Capital Improvement Program, and other planning mechanisms (see Mitigation Action Matrix for links between individual action items and associated planning mechanism). The



meetings of the Planning Team will provide an opportunity for Planning Team members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

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

- ✓ Risk Assessment, Community Profile, Planning Process (stakeholders) – General Plan Land Use Element, City’s Emergency Operations Plan
- ✓ Community Profile – General Plan Housing Element
- ✓ Risk Assessment, Hazard-Specific Sections, General Hazard Overviews – General Plan Safety Element
- ✓ Hazard-Specific Sections - Urban Water Management Plan
- ✓ Mitigation Actions Matrix – Annual Budget, Capital Improvement Program

As for the period of time between the writing of the original Hazard Mitigation Plan and present day, the only document utilized to assist in implementing the HMP was the City’s Emergency Operations Plan which was updated in 2017. Other documents that went through updates in that time period included the General Plan Housing Element, development of the Urban Water Management Plan, and funding mechanisms including the Annual Budget and the 5-year Capital Improvement Program. Although the HMP was not specifically referenced, many of the “ongoing” and/or “completed” mitigation action items were accomplished through these funding mechanisms.

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.

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.

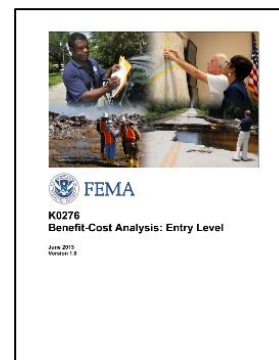
The BCA program consists of guidelines, methodologies and software modules for a range of major natural hazards including:

- ✓ 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.

Benefit/Cost Review

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. Please see the **Mitigation Strategies Section** for additional information.



Q&A | ELEMENT A: PLANNING PROCESS | A6

Q: A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

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



Evaluating and Updating the Plan

Evaluation

At the conclusion of the 4th Quarterly Report meeting each year, 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 4th Quarterly 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.

Formal Update Process

The Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the annual meeting. Planning Team members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The Planning Team will review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Planning Team will also review the **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, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The Local Mitigation Officer will assign the duty of updating the Plan to one or more of the Planning Team members. The designated Planning Team members will have three months to make appropriate changes to the Plan before submitting it to the Planning Team members. The Planning Team will also notify all holders of the City plan when changes have been made. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer at the California Office of Emergency Services and the Federal Emergency Management Agency for review and approval.

At each of the quarterly Planning Team meetings, the Local Mitigation Officer will facilitate a discussion on each section of the FEMA-approved Plan:

Planning Process – Update as necessary, including regulatory changes.

Risk Assessment - Determine if this information should be updated or modified, given any new available data.

Mitigation Strategies - Review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to



ensure they are addressing current and expected conditions. Most importantly, is the thorough review of the Mitigation Action Matrix. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

Item Identifier	Action Item and Ideas for Implementation	Coordinating Agency	Timeline	Plan Goals Addressed	Protect Life and Property	Public Awareness	Natural Systems	Emergency Services	Partnerships and Implementation	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: (Low Medium High)	Cost: (Low Medium High)	Priority: (Low Medium High)	2016 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
MULTI-HAZARD ACTION ITEMS															
EARTHQUAKE ACTION ITEMS															

Q&A | ELEMENT A: PLANNING PROCESS | A5

Q: A5. 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 Lomita is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be catalogued and made available at City hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters and on the City website. This site will also contain an email address and phone number where people can direct their comments and concerns. A public meeting will also be held after each evaluation or when deemed necessary by the Planning Team. The meetings will provide the public a forum in which they can express their concerns, opinions, or ideas about the Plan.

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

PART IV: APPENDIX

General Hazard Overviews

Earthquake Hazards

Measuring and Describing Earthquakes

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

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

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

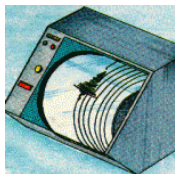
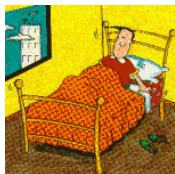



Another tool used to describe earthquake intensity is the Magnitude Scale. The Magnitude Scale is sometimes referred to as the Richter Scale. The two are similar but not exactly the same. The Magnitude Scale was devised as a means of rating earthquake strength and is an indirect measure of seismic energy released. The Scale is logarithmic with each one-point increase corresponding to a 10-fold increase in the amplitude of the seismic shock waves generated by the earthquake. In terms of actual energy released, however, each one-point increase on the Richter scale corresponds to about a 32-fold increase in energy released. Therefore, a Magnitude 7 (M7) earthquake is 100 times (10×10) more powerful than a M5 earthquake and releases 1,024 times (32×32) the energy.







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


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

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

Table: Modified Mercalli Intensity Scale

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

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

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	XII			Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Earthquake Related Hazards

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

Ground Shaking

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

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

Fault Rupture

The potential for ground rupture due to fault movement is related to the seismic activity of known fault zones. Faults such as the Palos Verdes could conceivably cause ground rupture within the City. Compared with the more active recognized fault zones, the potential for ground rupture due to seismic activity in the City is considered low.

Earthquake-Induced Landslide Potential

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

Flood Hazards

Flood Terminology

Floodplain

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

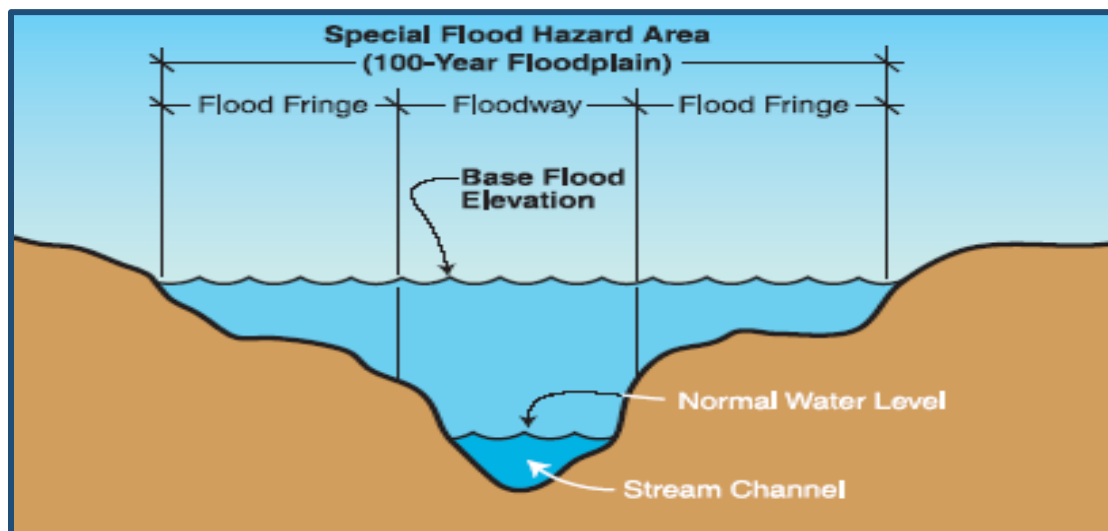
100-Year Flood

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

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

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

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



Floodway

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



Base Flood Elevation (BFE)

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

Types of Flooding

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

Urban Flooding

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

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

Riverine Flooding

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



Definitions of FEMA Flood Zone Designations

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

Moderate to Low Risk Areas

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

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

High Risk Areas

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

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



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

Undetermined Risk Areas

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

Windstorm Hazards

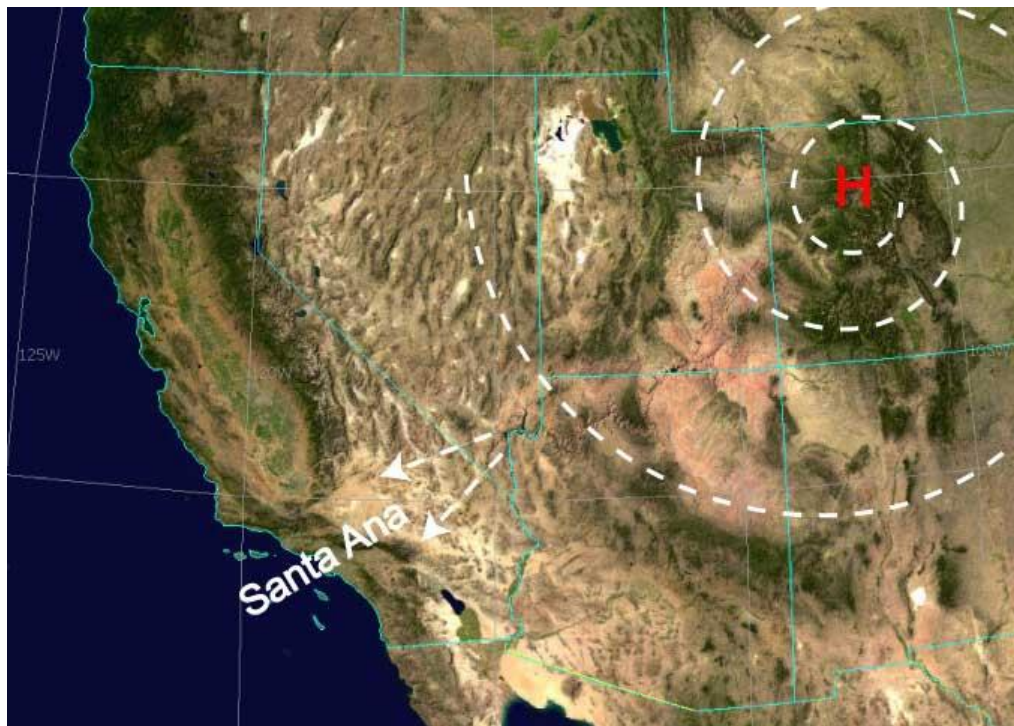
Hazard Characteristics

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

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

Figure: Santa Ana Winds

(Source: http://upload.wikimedia.org/wikipedia/commons/f/fa/Santa_ana_wind1.jpg)





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

Table: Beaufort Scale

(Source: <http://www.compuweather.com/decoder-charts.html>)

Beaufort Force	Speed (mph)	Wind Description - State of Sea - Effects on Land
0	Less 1	Calm - Mirror-like - Smoke rises vertically
1	1-3	Light - Air Ripples look like scales; No crests of foam - Smoke drift shows direction of wind, but wind vanes do not
2	4-7	Light Breeze - Small but pronounced wavelets; Crests do not break - Wind vanes move; Leaves rustle; You can feel wind on the face
3	8-12	Gentle Breeze - Large Wavelets; Crests break; Glassy foam; A few whitecaps - Leaves and small twigs move constantly; Small, light flags are extended
4	13-18	Moderate Breeze - Longer waves; Whitecaps - Wind lifts dust and loose paper; Small branches move
5	19-24	Fresh Breeze - Moderate, long waves; Many whitecaps; Some spray - Small trees with leaves begin to move
6	25-31	Strong Breeze - Some large waves; Crests of white foam; Spray - Large branches move; Telegraph wires whistle; Hard to hold umbrellas
7	32-38	Near Gale - White foam from breaking waves blows in streaks with the wind - Whole trees move; Resistance felt walking into wind
8	39-46	Gale - Waves high and moderately long; Crests break into spin drift, blowing foam in well-marked streaks - Twigs and small branches break off trees; Difficult to walk
9	47-54	Strong Gale - High waves with wave crests that tumble; Dense streaks of foam in wind; Poor visibility from spray - Slight structural damage
10	55-63	Storm - Very high waves with long, curling crests; Sea surface appears white from blowing foam; Heavy tumbling of sea; Poor visibility - Trees broken or uprooted; Considerable structural damage
11	64-73	Violent Storm - Waves high enough to hide small and medium sized ships; Sea covered with patches of white foam; Edges of wave crests blown into froth; Poor visibility - Seldom experienced inland; Considerable structural damage
12	>74	Hurricane - Sea white with spray. Foam and spray render visibility almost non-existent - Widespread damage. Very rarely experienced on land.

Santa Ana Winds and Tornado-Like Wind Activity

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



What are Santa Ana Winds?

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

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

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

What are Tornadoes?

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

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



Table: Fujita Tornado Damage Scale
(Source: <http://weather.latimes.com/tornadoFAQ.asp>)

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

Microbursts

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

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

Macrobursts are downbursts with winds up to 117 mph which spread across a path greater than 2.5 miles wide at the surface and which last from five to 30 minutes. The microburst, on the



other hand is confined to an even smaller area, less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 270 km/hr (170 mph) and often last for less than five minutes.

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

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

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

What is Susceptible to Windstorms?

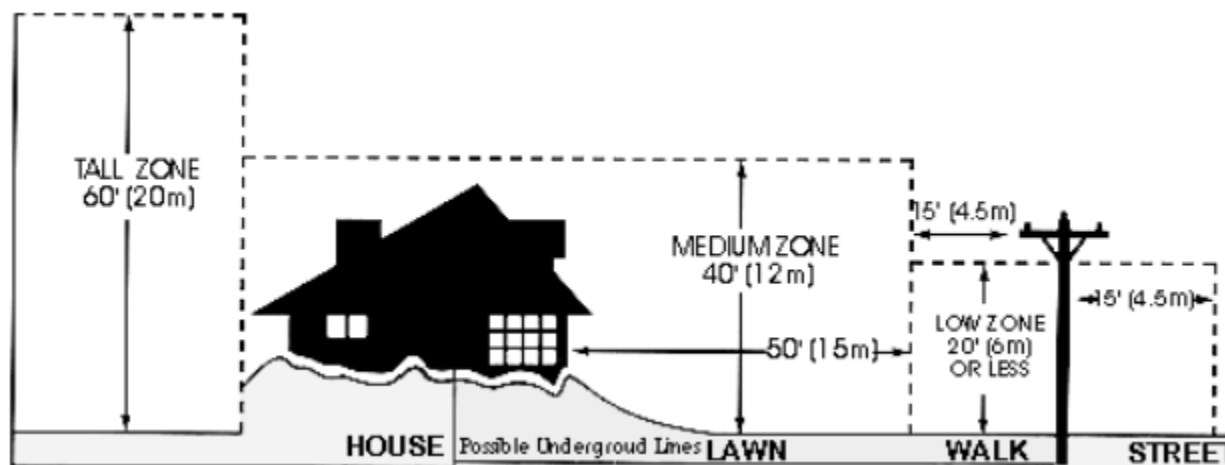
Life and Property

Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region which can be adversely impacted during a windstorm event. This can result in the involvement of City emergency response personnel during a wide-ranging windstorm or microburst tornadic activity. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure creates a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents creates lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

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

Utilities

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



Infrastructure

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

Increased Fire Threat

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

Transportation

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



Drought Hazards

Hazard Characteristics

Definition

Drought is defined as a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal". It is also related to the timing (e.g., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness of the rains (e.g., rainfall intensity, number of rainfall events). Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Human beings often exacerbate the impact of drought. Recent droughts in both developing and developed countries and the resulting economic and environmental impacts and personal hardships have underscored the vulnerability of all societies to this "natural" hazard.

One dry year does not normally constitute a drought in California, but serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure - its reservoirs, groundwater basins, and inter-regional conveyance facilities - mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

Many governmental utilities, the National Oceanic and Atmospheric Administration (NOAA), and the California Department of Water Resources, as well as academic institutions such as the University of Nebraska-Lincoln's National Drought Mitigation Center and the National Drought Mitigation Center, generally agree that there is no clear definition of drought. Drought is highly variable depending on location.

Drought Threat

The region's Mediterranean climate makes it especially susceptible to variations in rainfall. Severe water shortages could have a bearing on the economic well-being of the community. Comparison of climate (rainfall) records from Los Angeles with water well records beginning in 1930 from the San Gabriel Valley indicates the existence of wet and dry cycles on a 10-year scale as well as for much longer periods. The climate record for the Los Angeles region beginning in 1890 suggests drying conditions over the last century. With respect to the present day, climate data also suggests that the last significant wet period was the 1940s. Well level data and other sources seem to indicate the historic high groundwater levels (reflecting recharge from rainfall) occurred in the same decade. Since that time, rainfall (and groundwater level trends) appears to be in decline. This slight declining trend, however, is not believed to be significant. Climatologists compiled rainfall data from 96 stations in the State that spanned a



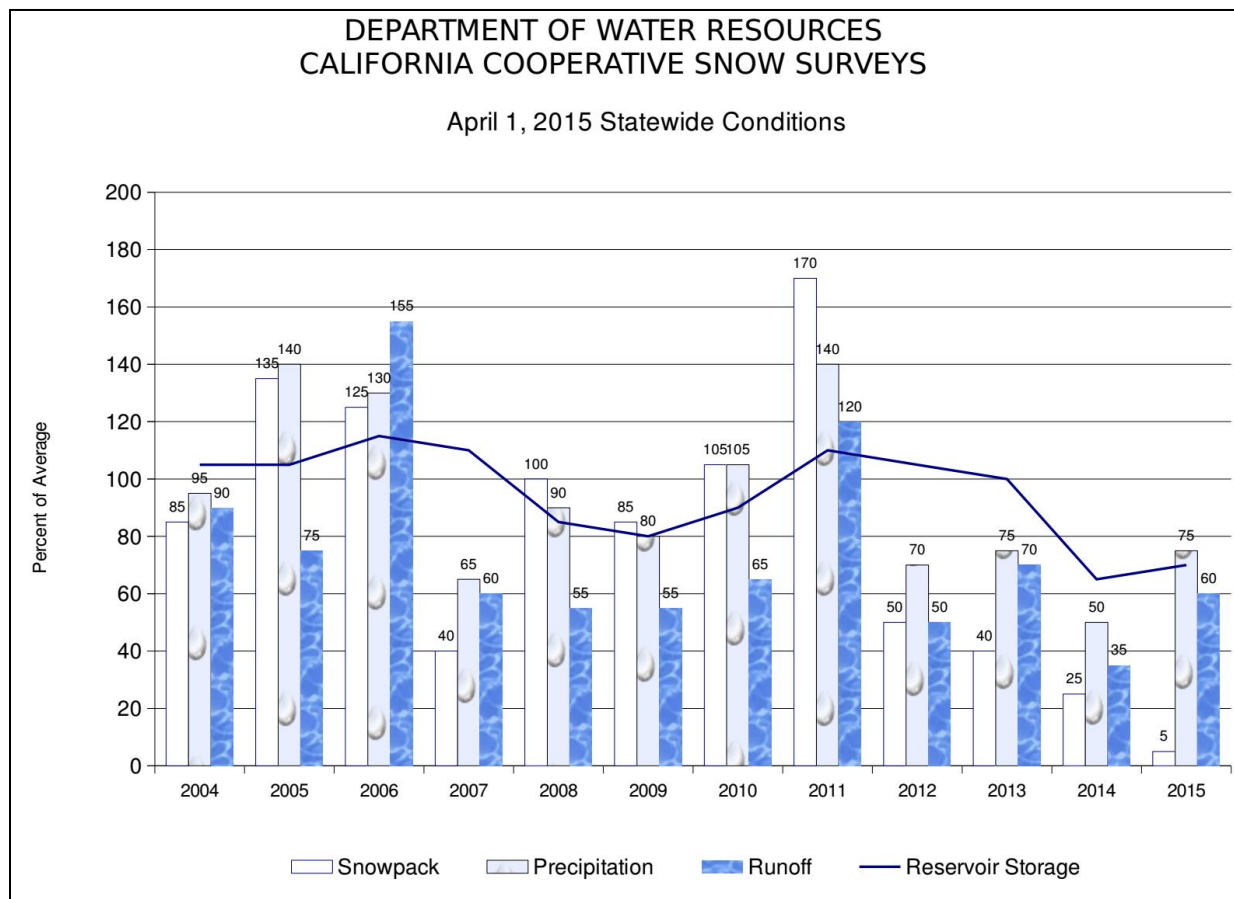
100-year period between 1890 and 1990. An interesting note is that during the first 50 years of the reporting period, there was only one year (1890) that had more than 35 inches of rainfall, whereas the second 50-year period recording of 5 year intervals (1941, 1958, 1978, 1982, and 1983) that exceeded 35 inches of rainfall in a single year. The year of maximum rainfall was 1890 when the average annual rainfall was 43.11 inches. The second wettest year on record occurred in 1983 when the State's average was 42.75 inches.

The driest year of the 100-year reported in the study was 1924 when the State's average rainfall was only 10.50 inches. The region with the most stations reporting the driest year in 1924 was the San Francisco Bay area. The second driest year was 1977 when the average was 11.57 inches. The most recent major drought (1987 to 1990) occurred at the end of a sequence of very wet years (1978 to 1983). A study that documented annual precipitation for California since 1600 from reconstructed tree ring data indicates that there was a prolonged dry spell from about 1755 to 1820 in California. Fluctuations in precipitation could contribute indirectly to a number of hazards including wildfire and the availability of water supplies.

General Situation

Figure: Water Supply Conditions below illustrates several indicators commonly used to evaluate California water conditions. The percent of average values are determined for measurement sites and reservoirs in each of the State's ten major hydrologic regions. Snow pack is an important indicator of runoff from Sierra Nevada watersheds, the source of much of California's developed water supply.

Figure: Water Supply Conditions
(Source: California Department of Water Resources)



Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multiyear period. There is no universal definition of when a drought begins or ends.

Types of Drought

There are four different ways that drought can be defined:

- (1) Meteorological - a measure of departure of precipitation from normal. Due to climatic differences what is considered a drought in one location may not be a drought in another location.
- (2) Agricultural - refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.
- (3) Hydrological - occurs when surface and subsurface water supplies are below normal.
- (4) Socioeconomic - refers to the situation that occurs when physical water shortage begins to affect people.



Historical California Droughts

A significant drought, reported by many of the ranchers in southern California, occurred in 1860. The great drought of the 1930s, coined the "Dust Bowl," was geographically centered in the Great Plains yet ultimately affected water shortages in California. The drought conditions in the plains resulted in a large influx of people to the west coast. Approximately 350,000 people from Arkansas and Oklahoma immigrated mainly to the Great Valley of California. As more people moved into California, including Los Angeles County increases in intensive agriculture led to overuse of the Santa Ana River watershed and groundwater resulting in regional water shortages. Several bills have been introduced into Congress in an effort to mitigate the effects of drought. In 1998, President Clinton signed into law the National Drought Policy Act, which called for the development of a national drought policy or framework that integrates actions and responsibilities among all levels of government. In addition, it established the National Drought Policy Commission to provide advice and recommendations on the creation of an integrated federal policy. The most recent bill introduced into Congress was the National Drought Preparedness Act of 2003, which established a comprehensive national drought policy and statutorily authorized a lead federal utility for drought assistance. Currently there exists only an ad-hoc response approach to drought unlike other disasters (e.g., hurricanes, floods, and tornadoes) which are under the purview of FEMA.

Droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 droughts established the criteria commonly used in designing storage capacity and yield of large Northern California reservoirs. The driest single year of California's measured hydrologic record was 1977. According to USGS, California's most recent multi-year droughts occurred between 1987-92, 2006-2010 and 2012-2016.

Past California Droughts

The historical record of California hydrology is brief in comparison to the time period of geologically modern climatic conditions. The following samplings of changes in climatic and hydrologic conditions help put California's twentieth century droughts into perspective, by illustrating the variability of possible conditions. Most of the dates shown below are approximations, since the dates must be inferred from indirect sources.

11,000 years before present

Beginning of Holocene Epoch- Recent time, the time since the end of the last major glacial epoch.

6,000 years before present

Approximate time when trees were growing in areas now submerged by Lake Tahoe. Lake levels were lower then, suggesting a drier climate.

900-1300 A.D. (Approximate)

The Medieval Warm Period, a time of warmer global average temperatures. The Arctic ice pack receded, allowing Norse settlement of Greenland and Iceland. The Anasazi civilization in the Southwest flourished, its irrigation systems supported by monsoonal rains.

1300-1800 A.D. (approximate)



The Little Ice Age, a time of colder average temperatures. Norse colonies in Greenland failed near the start of the time period, as conditions became too cold to support agriculture and livestock grazing. The Anasazi culture began to decline about 1300 and had vanished by 1600, attributed in part to drought conditions that made agriculture infeasible.

Mid - 1500s A.D.

Severe, sustained drought throughout much of the continental U.S., according to dendrochronology. Drought suggested as a contributing factor in the failure of European colonies at Parris Island, South Carolina and Roanoke Island, North Carolina.

1850s A.D.

Sporadic measurements of California precipitation began.

1890s A.D.

Long-term stream flow measurements began at a few California locations.

Palmer Drought Severity Index

Of the many varied indexes used to measure drought, the "Palmer Drought Severity Index" (PDSI) is the most commonly used drought index in the United States. Developed by meteorologist Wayne Palmer, the PDSI is used to measure dryness based on recent temperature compared to the amount of precipitation. It utilizes a number range, 0 as normal, drought shown in terms of minus numbers, and wetness shown in positive numbers. The PDSI is most effective at analyzing long-range drought forecasts or predications. Thus, the PDSI is very effective at evaluation trends in the severity and frequency of prolonged periods of drought, and conversely wet weather. The National Oceanic and Atmospheric Administration (NOAA) publish weekly Palmer maps, which are also used by other scientists to analyze the long-term trends associated with global warming and how this has affected drought conditions.

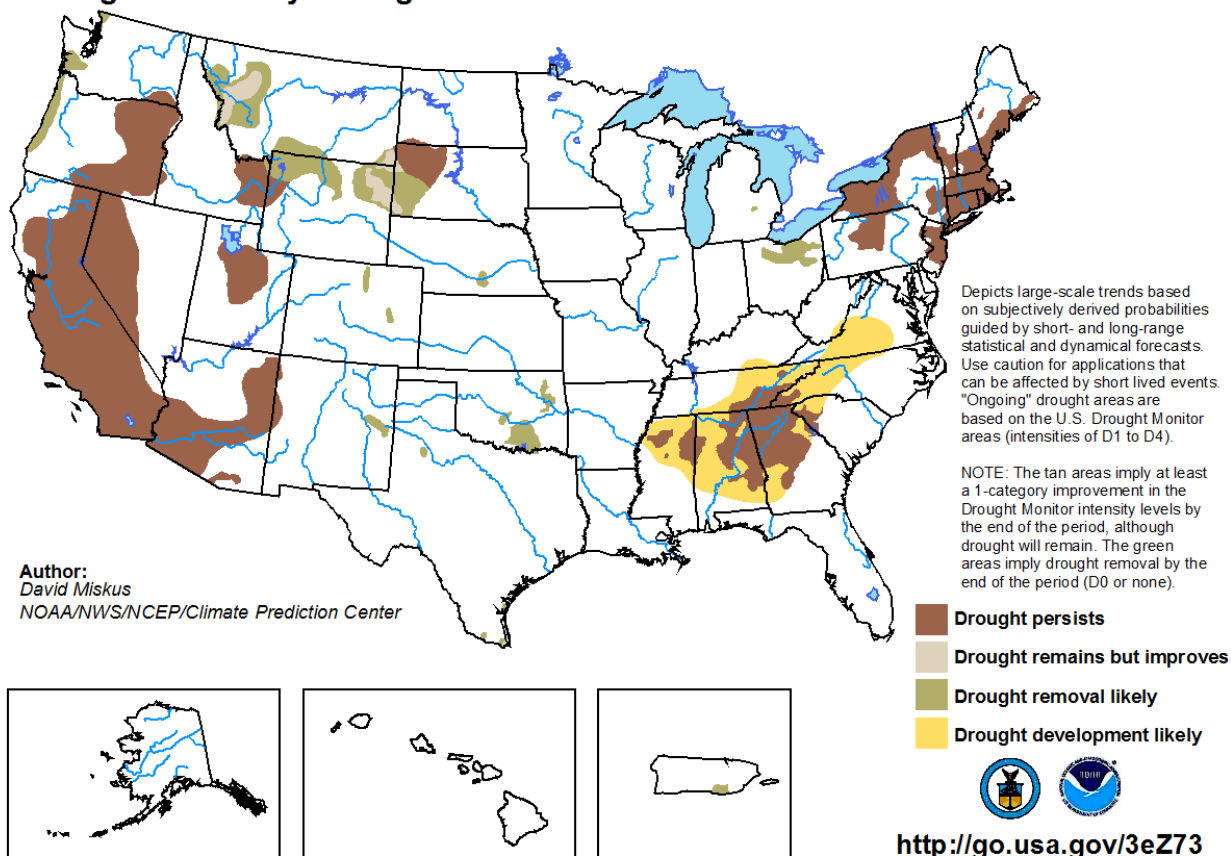
The University of Nebraska-Lincoln has published many of these Palmer Drought Index maps analyzing trends over the past one hundred years (National Drought Mitigation Center 2005; Figure I). In coastal southern California, from 1895 to 1995, severe droughts occurred ten to 15 percent of the time. From 1990 to 1995, severe droughts occurred ten to 20 percent of the time and as recently as 1989, a severe drought was documented that lasted for six years. More recently, between 1999 and 2004, a six-year drought on the Colorado River basin has resulted in a drawdown of Colorado River water storage by more than 50 percent. Based on these trends, severe droughts can readily occur in southern California. According to the California Natural Resources Conservation Service (NRCS), the current drought in southern California has caused extensive devastation to forests in the mountains of San Bernardino, San Jacinto and Palomar Mountains. Drought weakens trees which make them susceptible to infestation by bark-beetles. In turn dry vegetation and beetle infested trees are more susceptible to fire than healthy forests.

The following map is the most current snapshot of drought conditions across the U.S. It is provided by NOAA's Climate Prediction Center.

Map: U.S. Seasonal Drought Outlook
(Source: NOAA Climate Prediction Center)

U.S. Seasonal Drought Outlook

valid for September 15 - December 31, 2016
Drought Tendency During the Valid Period
Released September 15, 2016





Attachments

FEMA Letter of Approval

U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052



FEMA

December 18, 2018

Laura Vander Neut
Management Analyst & Emergency Services Coordinator
City of Lomita
24300 Narbonne Avenue
Lomita, CA 90717

Dear Ms. Vander Neut:

We have completed our final review of the *City of Lomita Local Hazard Mitigation Plan*, officially adopted by the City of Lomita on December 4, 2018 and found the plan to be in conformance with Title 44 Code of Federal Regulations (CFR) Part 201.6 *Local Mitigation Plans*.

The approval of this plan ensures the City of Lomita's continued eligibility for project grants under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program. All requests for funding, however, will be evaluated individually according to the specific eligibility, and other requirements of the particular program under which applications are submitted.

Also, approved hazard mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Additional information regarding the CRS can be found at <https://www.fema.gov/national-flood-insurance-program-community-rating-system> or through your local floodplain manager.

FEMA's approval of the *City of Lomita Local Hazard Mitigation Plan* is for a period of five years, effective starting the date of this letter. Prior to December 18, 2023, the City of Lomita is required to review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding. The enclosed plan review tool provides additional recommendations to incorporate into the plan when the City of Lomita undertakes its identified plan maintenance process.

If you have any questions regarding the planning or review processes, please contact JoAnn Scordino, Community Planner, at (510) 627-7225 or by email at joann.scordino@fema.dhs.gov.

Sincerely,

Juliette Hayes
Director
Mitigation Division
FEMA, Region IX



City Council Resolution – Adoption of Final Draft Plan

RESOLUTION NO. 2018-33

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LOMITA, CALIFORNIA ADOPTING THE 2018 HAZARD MITIGATION PLAN.

WHEREAS, in 2000, the Federal Disaster Mitigation Act of 2000 was passed requiring state and local governments to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies; and

WHEREAS, on January 1, 2007, California Assembly Bill 2140 was passed which placed limits on the amount of additional state funding to local jurisdictions for certain disaster recovery projects funded by the California Disaster Assistance Act, unless a local jurisdiction has a state and federally approved local Hazard Mitigation Plan and has incorporated the Hazard Mitigation Plan into the jurisdiction's Safety Element; and

WHEREAS, the City Council recognizes the threat that natural hazards pose to people and property within the City of Lomita; and

WHEREAS, the City of Lomita has prepared a multi-hazard mitigation plan, hereby known as the 2018 Hazard Mitigation Plan in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the 2018 Hazard Mitigation Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Lomita from the impacts of future hazards and disasters; and

WHEREAS, adoption by the City Council demonstrates their commitment to hazard mitigation and achieving the goals outlined in the 2018 Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Lomita does hereby approve the 2018 Hazard Mitigation Plan (Exhibit A).



PASSED, APPROVED AND ADOPTED this 4th day of December 2018.


Henry Sanchez, Jr.,
Mayor

ATTEST:


Sandra M. Medina, MMC
City Clerk

I hereby certify the foregoing resolution was duly adopted by the City Council of the City of Lomita at a regular meeting held on the 4th day of December, 2018 by the following vote:

AYES: Council Members: Savidan, Segawa, Waronek, Mayor Pro Tem Gazeley, and Mayor Sanchez

NOES: None

ABSENT: None


Sandra M. Medina, MMC
City Clerk

EXHIBIT A – 2018 Hazard Mitigation Plan



City Council Agenda – Adoption of Final Draft Plan

Lomita City Council Meeting Agenda

December 4, 2018

- d. Adoption of the 2018 Hazard Mitigation Plan

Res 2018-33 – A Resolution of the City Council of the City of Lomita, California adopting the 2018 Hazard Mitigation Plan.

ACTION: That the City Council adopt a resolution adopting the 2018 Hazard Mitigation Plan.

- e. Approval of a resolution adopting an Amended Conflict of Interest Code for the City pursuant to the Political Reform Act of 1974

Res. 2018-34 – A Resolution of the City Council of the City of Lomita, adopting and approving an amended Conflict of Interest Code pursuant to the Fair Political Reform Act of 1974.

ACTION: That the City Council adopt the resolution approving and adopting an amended Conflict of Interest Code pursuant to Political Reform Action of 1974.

- f. Discussion and approval of the Disposal of Equipment

ACTION: That the City Council authorize the Administrative Services Director to exercise the sale of or otherwise dispose of surplus City property through General Auction Company.

- g. Authorize the City Manager to execute a Lease Agreement with the Roman Catholic Archdiocese of Los Angeles for 300 acre-feet of unused FY 2018-19 groundwater pumping rights

ACTION: That the City Council authorize the City Manager to execute a Lease Agreement with the Roman Catholic Archdiocese of Los Angeles for 300 acre-feet of unused FY 2018-19 groundwater pumping rights; at a price of \$100.00 per acre-foot for a total cost of \$30,000.

- h. Consider approval of Change Order No. 4 for the construction contract with Stephen Doreck Equipment Rentals, Inc. for the 250th Street Water Main Replacement and Street Rehabilitation and Doria Avenue Water Main Replacement Project

ACTION: That Change Order No. 4 for the construction contract with Stephen Doreck Equipment Rentals, Inc. for the 250th Street Water Main Replacement and Street Rehabilitation and Doria Avenue Water Main Replacement Project in the amount of \$198,496.69.



Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A: See **Planning Team Sign-In Sheets** and **Planning Team Agendas** below.

Planning Team Invitation and Sign-In Sheets

Hi All,

As you may (or may not) know, the City Council just approved a contract with a consultant to update our Hazard Mitigation Plan and Emergency Operations Plan. The Plan update process is specifically outlined by the Federal and State governments. As part of the process, we will be creating a planning team comprised of representatives from each City Department. This is where you come in! Your role will be to provide department specific background information and experience during the planning team meetings. We will be having about six 2-hour meetings over the next six months. There should not be much additional time commitment required besides just being present at the meetings and perhaps looking up some background info for the consultant.

I'm planning on scheduling our Planning Team Kick-off Meeting for Thursday, April 28 at 10:00 a.m. and I will send out a meeting invitation shortly. Please let me know as soon as possible if you won't be able to attend on that day.

Thanks!

Laura Vander Neut
Management Analyst
City of Lomita
Phone: (310) 325-7110, ext. 151
Fax: (310) 325-4024



City of Lomita
Hazard Mitigation Planning Team Meeting #1
April 28, 2016

Name	Department
CAROLYN HARSHMAN	EMERGENCY PLANNING CONSULTANTS
MICHAEL SANBURY	PARKS DEPARTMENT
Laura Vander Neut	CM. Office
LAURA WALTERS	LA County Fire Dept.
Mark Andersen	Lomita Public Works
Susan Kamada	Finance
Alicia Velasco	Community Development
JOHN DESPOT	LASD / LOMITA STATION

City of Lomita
Hazard Mitigation Planning Team Meeting #2
May 26, 2016

Name	Department
CAROLYN HARSHMAN	EMERGENCY PLANNING CONSULTANTS
MIKE SANBURY	FIELD OPERATIONS MANAGER (PARKS)
Mark Andersen	" P.W
Susan Kamada	Finance
LAURA WALTERS	LA County Fire
JOHN DESPOT	LASD / LOMITA
Alicia Velasco	Lomita
Laura Vander Neut	CM Office
Jeffrey Robinson	ARPA of Los Angeles County



City of Lomita
Hazard Mitigation Planning Team Meeting #3
July 21, 2016

Name	Department
CAROLYN HARSHMAN	EMERGENCY PLANNING CONSULTANTS
Susan Kamada	Finance
Laura VanderNeut	CM office
LAURA WALTERS	LA County FIRE
Jeff Robinson	Area B
Mack Andersen	Public Works



Planning Team Meeting Agendas

Agenda

City of Lomita

Planning Team Meeting #1

April 28, 2016

1. Examine the purpose hazard mitigation.
2. Discuss the concepts and terms related to hazard mitigation planning.
3. Review the project schedule and public involvement during the plan writing phase.
4. Discuss initial results of Hazard Analysis and Rank Hazards.
5. Gather Updated Community Profile Data
 - a. History, Geography, Land Use, Demographics, CIP

Agenda

City of Lomita

Planning Team Meeting #2

May 28, 2016

1. Review examples of hazard mitigation activities.
2. Update Existing and Development New Hazard Mitigation Action Items.
 - a. Action Item
 - b. Goals Achieved
 - c. Coordinating Agency
 - d. Timeline
 - e. Funding Source
 - f. Planning Mechanisms
 - g. Benefit, Cost, and Priority Ranking
 - h. Does action item apply to existing or future buildings or infrastructure?



Agenda

City of Lomita

Planning Team Meeting #3

July 21, 2016

- 1. Review First Draft Plan (distributed ahead of meeting to all members).**
- 2. Continue to Develop Additional Mitigation Action Items - Review County of Los Angeles All-Hazard Mitigation Plan**
- 3. Discuss Strategy for Distributing Second Draft Plan to External Agencies and General Public. Also, discuss sending to City Council as a consent agenda (information item) in advance of submission to Cal OES/FEMA for formal review. Upon return of Conditional Approval, updated Plan will be set for a public meeting with the City Council for Plan adoption.**

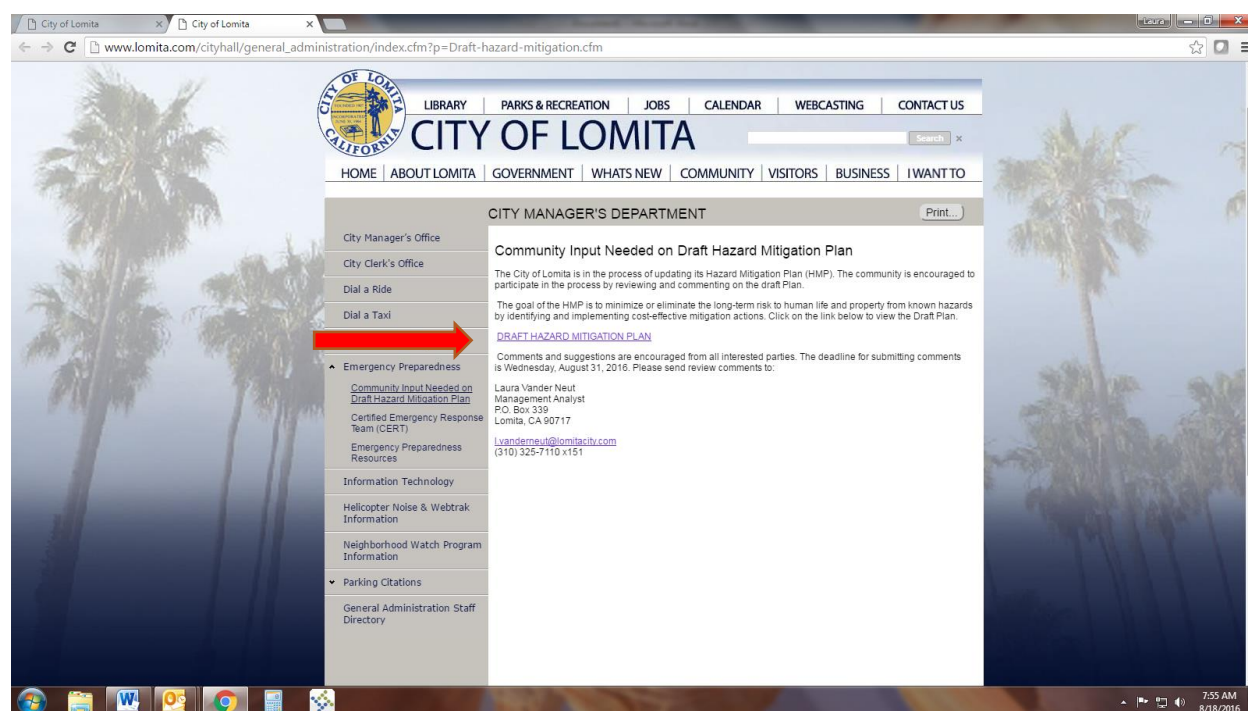


Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **Web Postings and Notice & List of External Agencies** below.

Web Postings



Hazard Mitigation Plan | 2018

Attachments

- 160 -



Notice and List of External Agencies

City of Lomita Draft Hazard Mitigation Plan Review People

Laura Vander Neut <l.vanderneut@lomitacity.com> Aug 17 at 2:58 PM

To: CDonovan@ElSegundo.org, vosorio@gardenapd.org, dherandez@cityofhawthorne.org, econcas@hermosabch.org, ctaniguchi@cityofinglewood.org, and 12 more...

Dear Colleagues,

The City of Lomita is in the process of updating its Hazard Mitigation Plan (HMP). The HMP identifies the natural hazards within our community. The Plan also provides a list of mitigation action items that can be used to reduce the impacts from these hazards.

Part of the mandated approval process for the HMP requires the City to share this document with key organizations within the community and solicit comments during the plan writing phase. I am asking you to please review this draft version of the HMP and share your comments with me by Wednesday, August 31, 2016. The Draft Plan can be viewed at the following link:
http://www.lomita.com/cityhall/general_administration/index.cfm?p=Draft-hazard-mitigation.cfm

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. Please forward your comments directly to me for inclusion in the HMP.

Thanks in advance for your time and assistance,

Laura Vander Neut
 Management Analyst
 City of Lomita
 Phone: (310) 325-7110, ext. 151
 Fax: (310) 325-4024

Agency	Name	Job Title
City of El Segundo	Chris Donovan	Fire Chief
City of Gardena	Vince Osorio	Police Lieutenant
City of Hawthorne	Dennis Hernandez	Risk Manager
City of Hermosa Beach	Erin Concas	Emergency Management Coordinator
City of Inglewood	Claudio Taniguchi	Emergency Preparedness Coordinator
City of Lawndale	Jaime Guerrero	Emergency Preparedness Coordinator
City of Manhattan Beach	Ronald Laursen	Fire Battalion Chief
City of Palos Verdes Estates	Marcelle Herrera	Community Relations Officer/Emergency Services Coordinator
City of Rancho Palos Verdes	Tracy Bonano	Senior Analyst/Emergency Manager
City of Redondo Beach	Issac Yang	Fire Division Chief, Special Services/Disaster Preparedness
City of Rolling Hills	Ray Cruz	City Manager
City of Rolling Hills Estates	Greg Grammer	Assistant City Manager
City of Torrance	Dariusz Wawryk	Police Sergeant
Los Angeles County Public Works, Building & Safety Division	Kit Bagnell	Asst. Superintendent of Building
SoCal Gas	Faviola Ochoa	Public Affairs Manager, South Bay
So. California Edison	John Tierney	Account Manager
California Water Service Company	Dan Trejo	Asst. District Manager