



City of Loma Linda

LOCAL HAZARD MITIGATION PLAN

*Prepared by
Loma Linda Fire Department*

September 7, 2011



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2011 Resolution

RESOLUTION NO. 2714

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LOMA LINDA, ADOPTING AND AUTHORIZING REVISIONS TO THE LOCAL HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000 (DMA 2000) (Public Law 106-390) amended the Robert t. Stafford Disaster Relief and Emergency Assistance Act (the Act) by repealing Mitigation Planning Section 409 and replacing it with Section 322; and

WHEREAS, to implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) published Interim Final Rules (IFRs) in the Federal Register on February 26, 2002 and October 1, 2002; and

WHEREAS, these Interim Final Rules established the mitigation planning requirements for local governments and required that in order to remain eligible to receive federal funding for both pre-disaster and post-disaster mitigation project funding, a local government must have a FEMA approved and locally adopted Local Hazard Mitigation Plan written in accordance with Section 322 of the Act; and


WHEREAS, the Federal Emergency Management Agency has endorsed both Local and Multi-Jurisdictional Hazard Mitigation Plans as a partnership encouraging multi hazard approaches to disaster resistant communities; and

WHEREAS, the City of Loma Linda has established local risks, hazards, current and future mitigation measures and goals and objectives;

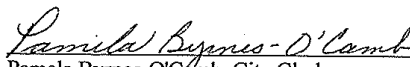
NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Loma Linda hereby adopts the Local Hazard Mitigation Plan and authorizes minimal needed revisions.

PASSED, APPROVED AND ADOPTED this 23rd day of August 2011 by the following vote:

Ayes:	Rigsby, Popescu, Brauer, Dailey, Dupper
Noes:	None
Absent:	None
Abstain:	None


Rhodes Rigsby, Mayor

ATTEST:


Pamela Byrnes-O'Camb, City Clerk



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Section 1 Introduction

1.1 Purpose of the Plan

Hazard mitigation reduces or eliminates losses of life and property. After disasters, repairs and reconstruction are often necessary to restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions could result in a cycle of damage, reconstruction, and repeated damage. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage. This Plan identifies hazards and the mitigation actions implemented to reduce the effects of these hazards.

1.1.1 Overview

The *Robert T. Stafford Disaster Relief and Emergency Assistance Act* (Stafford Act), as amended by the *Disaster Mitigation Act* of 2000 (DMA 2000), switched the focus from hazard-specific Mitigation Plans to Multi-Hazard Mitigation Plans in an effort to promote a more comprehensive, dynamic planning approach. Additionally, DMA 2000 encourages combining single jurisdictional planning efforts to create Multi-Jurisdictional Hazard Mitigation Plans (MJHMP). It should also be noted that an approved Local Hazard Mitigation Plan (LHMP) is required to receive federal assistance under the Hazard Mitigation Grant Program (HMGP) or Pre Disaster Mitigation (PDM) programs.

In 2005, the County of San Bernardino Office of Emergency Services (County OES) and approximately 56 cities, towns, and special districts collaborated to develop a countywide Multi-Jurisdictional Hazard Mitigation Plan (MJLHMP) to meet the federal requirements. A web-based program, *Visual Risk*, was utilized to assist in the development of individual plans that allowed partners to insert information into a program which calculated the risks and produced a plan document. The Hazard Mitigation Plans are required to be updated, adopted and approved every five (5) years.

The current updates in 2011 are being done to satisfy the five-year federal requirements. Once again, the City of Loma Linda is participating in the County's MJLHMP and is one of 55 partners. The 55 partners include all 24 incorporated cities and towns, 30 special districts, and the unincorporated areas. County OES hired a contractor (ICF International) to support these efforts to update the 55 local LHMPs and the *San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan*. This support includes providing technical expertise, resource material and tools, not only to expedite the LHMP update process, but also to ensure that the updates are in compliance with federal requirements of the program. The tools, resource material, and other project related information are being maintained on a project web portal <https://tmsprojects.icfi.com/sbLHMPupdate/default.aspx> to ensure the same information is available to all participants.

Although the LHMPs are intended to identify, assess, and mitigate community risk; the FEMA *Local Multi-Hazard Mitigation Planning Guidance* emphasizes that the LHMP should be more "performance standard" rather than "prescriptive"; meaning that the plans should identify "what" needs to be done rather than "how" it should be done.



1.2 Authority

The DMA 2000, Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identifies and prioritizes mitigation actions, encourage the development of local mitigation and provides technical support for those efforts. This mitigation plan serves to meet those requirements for the City of Loma Linda.

1.3 Community Profile

1.3.1 Physical Setting

The City of Loma Linda remains the same size as in 2005 which extends in a roughly square pattern (8 square miles). It is located in the southern part of the San Bernardino Valley. Loma Linda is bordered on the east by the City of Redlands, on the north by the City of San Bernardino (and I-10 freeway), on the west by the City of Colton, and is bordered on the south by the Badland Hills and the Riverside County line. Loma Linda is a part of the Santa Ana River floodplain on the north side, with an elevation of 1053', which gradually rises in elevation to 1850' to the south Badland Hills/Riverside County line. The *San Bernardino Valley Map (Map 1.1)* shows the location of the City.

1.3.2 History

Loma Linda traces its roots to the Spanish/Rancho period (1769 to 1848) when an Asistencia or outpost of the San Gabriel Mission was established in the area. As the missions began to decline, the area became part of a land grant known as Rancho San Bernardino. As early settlers entered the region, the Rancho was transformed into a vast producing area of citrus crops.

In the late 1800s the railroad companies encouraged development of tourist hotels along their lines. Loma Linda began as on such development known as Mound City. The community was originally established in 1876, but by the early 1880s, the property had been acquired by the Mound City Land and Water Company. The company built a water pipeline running northwest from the Scott Canyon Drainage to the site of platted community cottages, shops, and the \$30,000 Mound City Hotel. The intended residential development project ultimately failed.

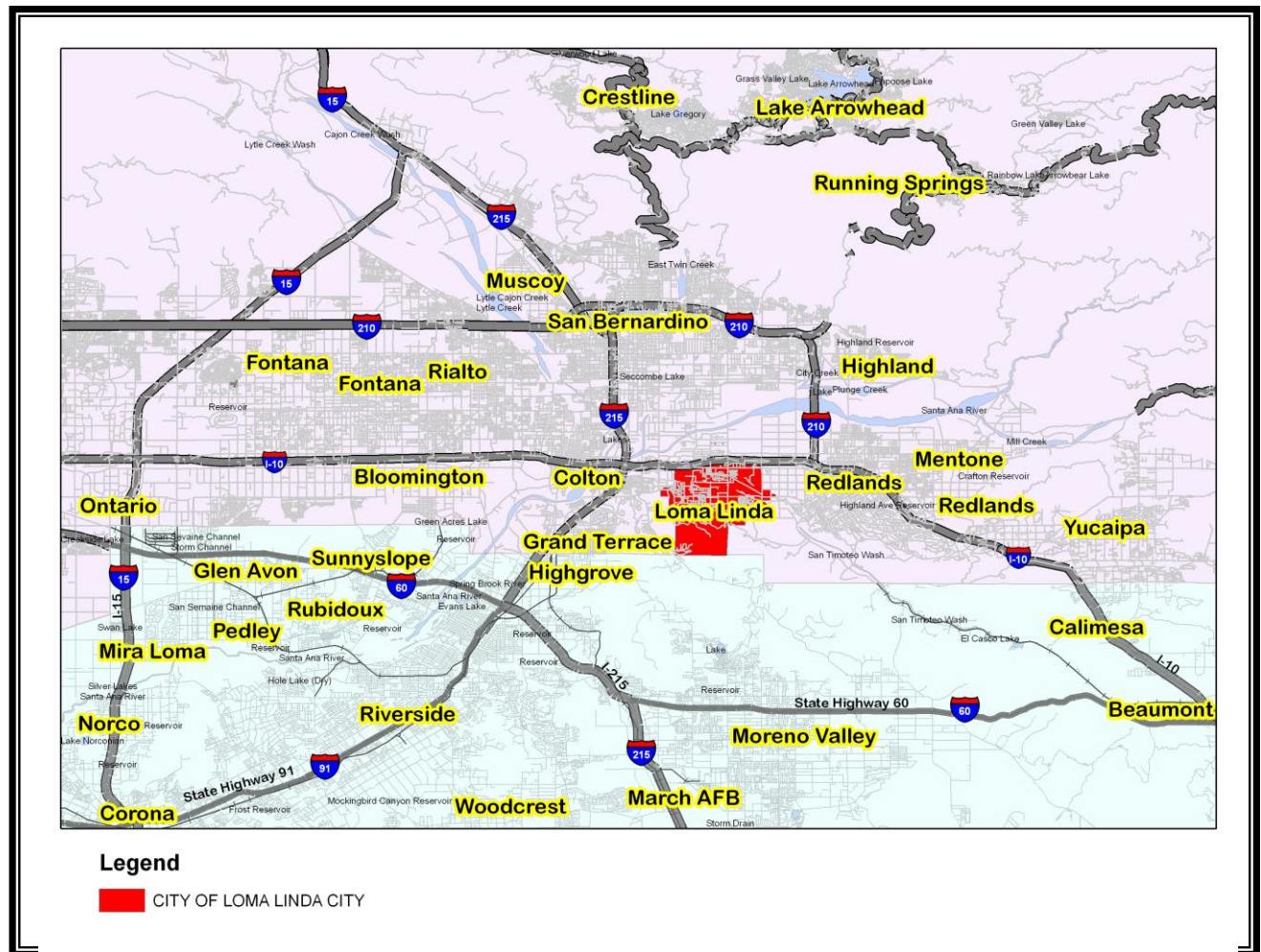
In the late 1890s, a group of Los Angeles businessmen and physicians purchased the hotel and reopened it as a health resort and convalescent hospital-resort (then called "Sanitariums") called Loma Linda (Spanish for "pretty hill."), and promoted it as "The Switzerland of America where health and pleasure are twins." This venture also failed, and the Loma Linda Hotel closed again in 1904 (and was nicknamed "Lonely Linda").

In 1905, the Seventh-day Adventist Church purchased the former resort property, re-opened the sanitarium and established a nursing school. A "College of Medical Evangelists" was opened in 1909, which became Loma Linda University in 1961. The Loma Linda Hotel was used as a university building until 1967, when it was demolished.

The College developed into a leading regional medical center, and the town grew as a college community. Orchards were an important aspect of the economic base into the 1920s and remain part of the character of Loma Linda. By the 1940s, the community had matured into a developed suburb of San Bernardino. Loma Linda was incorporated as a city in 1970.



San Bernardino Valley Map (Map 1.1)





1.3.3 Demographics

As in 2005, Loma Linda remains dominated by the Loma Linda University and associated medical community (such as the Loma Linda Medical Center, Loma Linda Children's Hospital, Faculty Medical Offices, Loma Linda V.A. Hospital, Loma Linda University heart and Surgical Hospital, Loma Linda Community Hospital). The City remains at approximately 21,000 residents; however, the daytime population can rise to approximately 60,000 people due to the employment, students, and healthcare that these facilities attract.

1.3.4 Existing Land Use

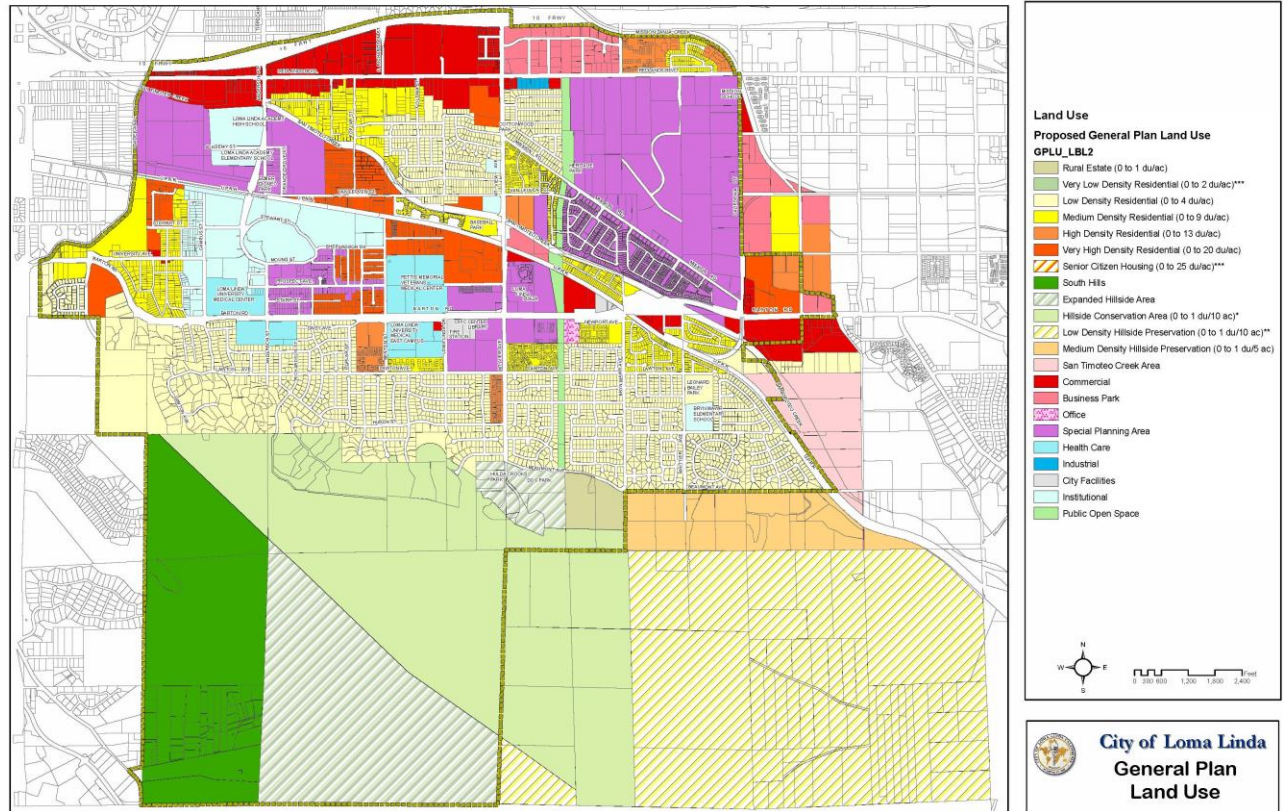
As in 2005, the existing land uses within the city and its sphere of influence is residential, commercial, and industrial. The *Land Use Map (Map 1.2)* illustrates the location and distribution of these land use areas. Residential land uses form the largest percentage of developed uses (24 percent). Of the residential uses, single-family residential development occurs within 14 percent of the jurisdiction. Other types of residential uses within the jurisdiction include rural residential (typically adjacent to orange groves or within the hillside), multifamily residential, and mobile homes.

Commercial uses make up a small percentage of the land use within Loma Linda, comprising about 3 percent of the city and its sphere of influence. Commercial uses consist of both general commercial and office commercial types of land use. Large commercial or office uses within the city include the auto dealerships south of the Interstate 10 freeway, the offices within the Corporate Business Center, and the Stater Bros. market. Land uses that are categorized as Institutional make up 9 percent of the jurisdiction. These uses include medical uses, university uses, schools, churches, public facilities, utilities, and utilities combined with agricultural uses. Of these sub-categories, utilities, university uses, and medical uses are the most well represented Institutional uses within the jurisdiction. Loma Linda University (LLU) and the Loma Linda University Medical Center and Children's Hospital (LLUMC/CH) are significant institutional uses within the city. Heavy and light industrial uses characterize approximately 31 acres or 0.5 percent of the jurisdiction.

Land devoted to open space, agricultural use, recreational use, or vacant land that is not developed totals approximately 3,867 acres or 63 percent of the jurisdiction. These areas include the hills located to the south and the remaining orange groves within the city and the sphere of influence. (For additional information please reference the *Loma Linda General Plan*).



City of Loma Linda Land Use Map (Map 1.2)





1.3.5 Development Trends

Loma Linda is a unique community with strong ties to its religious, educational and healing arts roots. The Loma Linda University Medical Center (LLUMC) and the Jerry L. Pettis Memorial Veterans Medical Center (VA Medical Center) are both internationally known. The City is also home to Loma Linda University, which, with the VA Medical Center and LLUMC, provides much of the economic base of the community. The City is seeking to expand upon this economic base with medical support services, research facilities, professional offices, and lodging accommodations.

In addition to increasing commercial and industrial opportunities, Loma Linda is in the process of managing residential growth to provide an appropriate range of housing opportunities, including executive housing, traditional single-family neighborhoods, and affordable housing for very low and low-income households and senior housing.

Since 2005 growth in the City has been slow, however, there has been new construction which includes housing for lower income residence and there is reconstruction of an old elementary school which will once again become an elementary school.

Loma Linda University and Medical Center are upgrading and building new teaching facilities. Loma Linda Academy is also upgrading facilities to provide more opportunities for students.



Section 2 Plan Adoption

2.1 Adoption by Local Governing Body

Although this LHMP is coordinated and maintained by the Loma Linda Fire Department, it is actually the culmination of recommendations from numerous stakeholders from City Departments, local organizations, private businesses, and the general public. Adoption of the 2011 LHMP is implemented by the City of Loma Linda City Council as a supporting document to the City 2009 General Plan. The 2011 LHMP represents a description of the City's commitment to significantly reduce or eliminate impacts of natural and human caused disasters through preparing and implementing comprehensive hazard mitigation plans and actions

2.2 Promulgation Authority

Loma Linda City Council is responsible for the review, approval and adoption of the 2011 Update of the Local Hazard Mitigation Plan (LHMP) for the City of Loma Linda. It is also the intent of the City Council to take appropriate actions to incorporate the 2011 LHMP into the City's 2009 General Plan. The LHMP was adopted by the City Council on Month Day, 2011. A copy of the resolution is located in the front of this LHMP.

2.2.1 Letter of Promulgation Signatory Authority

Rhodes Rigsby, Mayor /Agency Board Member
Ovidu Popescu, Mayor Pro Tempore/Agency Chairman
Ron Dailey, City Council Member/Agency Vice Chairman
Stan Brauer, City Council Member/Agency Board Member
Phill Dupper, City Council Member/Agency Board Member

2.3 Primary Point of Contact

The Point of Contact for information regarding this plan is:

Debra Kreske
Emergency Services Coordinator
Loma Linda Fire Department
25541 Barton Road
Loma Linda, CA 92354
(909) 799-2860



Section 3 Planning Process

3.1 Preparing for the Plan Updates

Planning creates a way to solicit and consider input from diverse interests. Involving stakeholders is essential to building community-wide support for the Plan. In addition to emergency managers, the planning process involves other city departments (e.g., community development, public works, etc.) businesses, community based organizations, civic groups, and schools.

The City LHMP planning efforts included the development of a *LHMP Planning Process* to identify timelines and meeting schedule. An additional document, *2011 LHMP Next Steps Follow-Up*, was developed to identify specific items in the LHMP that need to be updated and appropriate staff that would have access to the information necessary for these updates. These documents and meeting agendas can be found in Appendix A. Planning documents, such as the 2005 HMP and the 2009 General Plan were utilized when compiling resources to be used for the 2011 HMP updates.

3.1.1 County Planning Team

A County Operational Area Planning Team was established to identify the strategies, goals, activities, and development of the MJHMP. This Planning Team is comprised of representatives from various City and County departments. The City's ESC was a participant on this committee.

3.1.2 City Planning Team

The Emergency Services Coordinator led the updating process of the LHMP. The Planning Team consisted of representatives from Loma Linda University, Loma Linda University Medical Center, Redlands School District, and City departments who specialize in various areas to provide needed expertise in the development of the LHMP. (Figure 3.1)

LHMP Planning Team

Name	Title	Agency
Lynette Arreola	PW Executive Aide	City of Loma Linda
Jeff Bender	Fire Chief	City of Loma Linda
Konrad Bolowich	IS Director	City of Loma Linda
Gordon Day	Jr. High Principal	Loma Linda Academy
Diana DeAnda	Finance Director	City of Loma Linda
James Gray	Fire Marshal	City of Loma Linda
George Johnston	LLU Assistant Vice President	Loma Linda University
Debra Kreske	Emergency Services Coordinator	City of Loma Linda
Julia Loeffert	FD Executive Aide	City of Loma Linda
Pamela Byrnes-O'Camb	City Clerk	City of Loma Linda
Jim O'Neill	Principal	Bryn Mawr Elementary School
Allan Penaflorida	Assistant Planner	City of Loma Linda
Jason Peterson	LLUAHSC Emergency Mgt. Specialist	Loma Linda Univ. Medical Center
Jeff Peterson	Associate Engineer	City of Loma Linda
Jarb Thaipejr	City Manager	City of Loma Linda
Deborah Woldruff	Community Dev. Director	City of Loma Linda

Figure 3.1



The Planning Team met several times (*Figure 3.2*) to discuss the planning process, timelines and meeting schedules. Planning members reviewed portions of the 2005 HMP and identified changes that have taken place in the last five years. These comments were included throughout this 2011 HMP. The ESC coordinated individually with appropriate planning members to gather information for Plan development and data inclusion.

Planning Team Meetings

Date	Activity
July 1, 2010	Kick Off Meeting to overview the planning process, timelines and meeting schedules, and the roles of planning members.
Aug. 24, 2010	Team Meeting to discuss new timelines and next steps.
Sept. 13, 2010	Team Meeting to discuss new timelines and next steps.
Oct. 18, 2010	Team Meeting to distribute LHMP to team members for internal review.
Nov. 8, 2010	Team Meeting to discuss LHMP review.

Figure 3.2

3.2 Coordination with Other Jurisdictions, Agencies, and Organizations

As noted in 1.1, the City of Loma Linda is one of 55 partners in the development of the 2011 Multi-Jurisdictional Hazard Mitigation Plan. The ESC attended the MJLHMP meetings at various locations as well as participating on conference calls. The ESC was also a member of the MJLHMP Working Group which was a sub-group of partners to discuss planning efforts with County OES and the consultant.

The City of Loma Linda and other stakeholders coordinated with County OES in the discussion of various methodologies we would take as partners to update the countywide Multi-Jurisdictional Hazard Mitigation Plan. Partners in the MJHMP agreed that we should contract with a consultant to assist in managing the updates for all partners. As noted in earlier, County OES took the initiative to hire a consultant with Homeland Security Grant Program (HSGP) funding.

Coordination also took place within in the City of Loma Linda. Representatives from Loma Linda University Medical Center and the VA Loma Linda Healthcare System were part of the planning team as well as representatives from Loma Linda University. These representatives also reviewed 2005 HMP and identified changes that were included in the 2011 HMP.



3.3 Public Involvement/Outreach

Public review created a way for the City to solicit and consider input to the LHMP from various viewpoints. Involving the public was essential to building community-wide support for the plan and mitigation efforts throughout the City (*Figure 3.3*).

The HMP was presented at the City Council Meeting to let the public know that the HMP was available for their review. We also shared that same information at the Planning Commission Meeting and the Trails Development Committee Meeting. We sent an email to all our CERT and RACES volunteers to inform them of the availability of the HMP for review. We also informed the public through our website, local television station, and twittering that the plan was available for their review. Some members of the public read the plan and commented on the plan; these comments were reviewed and included in the HMP.

Public Meetings

Date	Public Meetings/Outreach
Nov. 9, 2010	City Council Meeting
Nov. 9, 2010	CERT Distribution
Nov. 9, 2010	RACES Distribution
Nov. 17, 2010	Planning Commission Meeting
Nov. 18, 2010	Trails Development Committee Meeting

Figure 3.3

3.4 Plan Review

Planning Team members provided information of events and projects that have occurred since the 2005 LHMP. Once this information was included in the 2011 LHMP it was distributed to Planning Team members for review. Team member comments and corrections were evaluated and included in the Plan. Following this review, the Plan was open for public comment and review (Section 3.3). Once all reviews were completed the Plan followed the review and adoption process (Section 2.1).



Section 4 Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard on lives, property and the environment. Mitigation also serves to reduce property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on risk assessment.

This risk assessment measures the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure and people. It identifies the characteristics and potential consequences of hazards, how much of the community could be affected by a hazard, and the impact on community assets.

4.1 Hazard Identification

4.1.1 Hazard Screening Criteria

Data collection and document review were important first steps in the identification and screening of hazards. There are no new or emerging hazards since 2005. Updated hazard maps were obtained from the Safety Element of the City of Loma Linda 2009 General Plan.

The first step in this process was to identify which natural and to lesser extent, manmade hazards exist in the City, starting with the hazards identified in the 2005 LHMP and augmenting as necessary. After the potential hazards were identified they went through the screening process.

The intent of screening of hazards was to help prioritize which hazard created the greatest concern in the City. The hazard screening criteria is based on evaluation done by the City of Loma Linda to analyze the geography and industry in and around the jurisdiction to identify the hazards that could impact the City. The 2005 Local LHMP identified the top three (3) hazards facing the community to be earthquakes, flood, and fires. The table below, 2005 Critical Priority Risk Index (*Figure 4.1*), represented the 2005 Critical Priority Risk Index which the *Visual Risk* web-based program produced.

2005 Critical Priority Risk Index

Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Priority Risk Index
Earthquake	Likely	Critical	Less 6 Hours	More than one week	3.25
Wildfires	Possible	Limited	Less 6 Hours	Less than one day	2.3
Flooding	Possible	Limited	6-12 Hours	Less than one week	2.25

Figure 4.1



The 2011 Local LHMP will also rank these top three (3) as the highest profile hazards (4.1.2 *Hazard Prioritization and Assessment*). In 2009 the City updated the General Plan which identified the hazards listed in the table below, *2011 Loma Linda Hazards (Figure 4.2)*. The table starts with the highest profile hazards first followed by other potential hazards that are a risk to the City. The table lists the hazard name, general location of the hazard, land use areas affected, number historic events, and the impacts of previous events (if known). Following this table, *Map 4.1, Land Use with Hazards Map*, depicts the location of the highest profile hazards within the City's Land Use Areas.

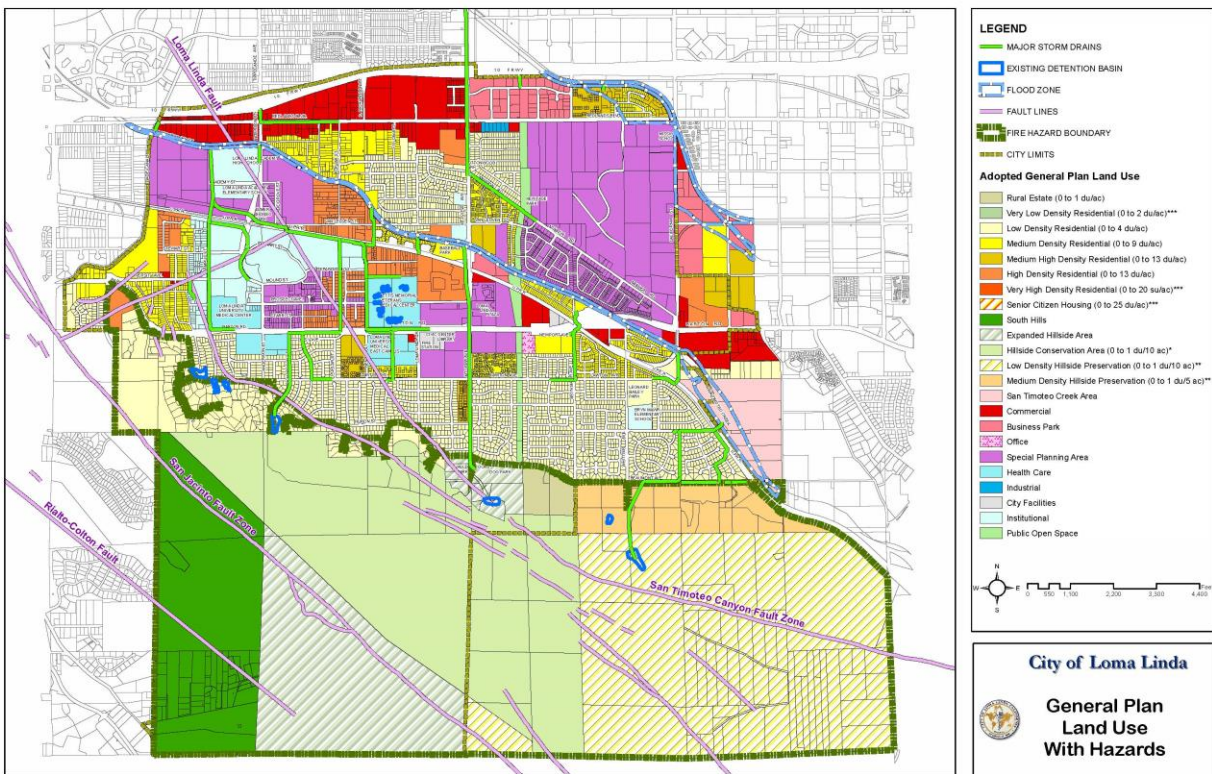
2011 Loma Linda Hazards

Hazard Name	Location	Land Use Areas	Number of Historic Events	Impact of Previous Events
Earthquake	Citywide (fault lines in specific areas)	<ul style="list-style-type: none">- hillside preservation area- conservation area- low to med density residential- institutional- high density residential	3	\$400,000.00 (most damage costs unknown)
Wildfires	South end of City along the "South Hills"	<ul style="list-style-type: none">- low density residential- conservation area- low to med density hillside preservation	10	unknown
Flooding	NE edge of City	<ul style="list-style-type: none">- next to canals- business parks- med to high density residential	5	\$19, 77.66 (most damage costs unknown)
Hazardous Waste and Materials	Near Freeway and train tracks.	<ul style="list-style-type: none">- med to high density residential- business parks- very high density residential	0	N/A
Slope Failure	South end of City along the "South Hills"	<ul style="list-style-type: none">- low density residential- hillside preservation area	0	N/A
Airplane/ Helicopter Crash	Citywide	<ul style="list-style-type: none">- all areas vulnerable	0	N/A
Railroad Accidents	Along train tracks.	<ul style="list-style-type: none">- med to high density residential- business parks- very high density residential	0	N/A
Terrorism	Citywide	<ul style="list-style-type: none">- all areas vulnerable	0	N/A

Figure 4.2



City of Loma Linda Land Use with Hazards Map (Map 4.1)





4.1.2 Hazard Prioritization and Assessment

In prioritizing hazards there is no “right” way to identify ranking. It is difficult to equate or compare hazards and their impacts. To prioritize the identified hazards within the City a non-numerical ranking system was utilized using the *Hazard Assessment Matrix* (Figure 4.3). This process consists of generating a non-numerical ranking (High, Medium, or Low) rating for “Probability” and “Impact” from each screened hazard. The Probability refers to the chance of the hazard happening again. The Impact refers to the impact the hazard has on the community.

The hazards are included in the table below. The red boxes represent the higher priority hazards, the yellow and green are the lower priority hazards.

Hazard Assessment Matrix				
		Impact		
		High	Medium	Low
Probability	High	• Earthquake	• Wildfires	
	Medium	• Flooding	• Hazardous Waste and Materials	• Slope Failure • Airplane Crash • Railroad Accidents
	Low	• Terrorism		

Figure 4.3

Probability

High = Highly Likely
Med. = Possible
Low = Unlikely

Impact

High = Catastrophic/Critical
Med. = Limited
Low = Negligible



4.2 Hazard Profile

This section discusses the three highest priority natural hazards in the City; earthquakes, wildfire, and flood. The remainder of identified hazards that threaten the City are not described in detail, as they are addressed in the City of Loma Linda 2009 General Plan. Each section below will describe the hazard, list known historical events, and display the extent of the hazard in the City.

4.2.1 Earthquakes

The City is located within the San Bernardino Valley, which is essentially a sediment-filled basin bounded by the San Andreas Fault on the northeast, the San Jacinto Fault on the southwest, and a series of northeast-trending faults on the southeast. The City has approximately 7 faults as seen in *Map 4.2, Geologic Hazard Map*. There have not been any new faults identified since 2005. The southern portion of the City is characterized by hills that have been uplifted and are currently dissected by active drainage, creating the badlands topography from which this terrain received its name. Even with such terrain, there have been no repetitive losses in the City.

Soils in the area range from gravelly loam to sandy loam. The soils on the alluvial valley floors and fans are well drained and very deep. The soils in the southern foothills are moderately deep to deep and overlay sandstone and shale on the hills.

Earthquakes in Southern California occur as a result of movement between the Pacific and North American plates. Faults of the San Andreas system are used to mark the boundary between the plates, but the deformation, faulting and associated earthquakes occur in a broadly distributed zone that stretches from offshore California to Nevada.

The faults considered most significant, though not necessarily located within the limits of the Planning Area, are detailed in *Figure 4.4*. Other faults exist in the area, but due to their distance from the City and lower probability of producing a large earthquake, they are considered to present a less significant risk to the City.

Major Active Faults Affecting the City

Fault	Distance (Miles)	Direction from City	Maximum Credible Earthquake (Richter)	Maximum Probable Magnitude (Richter)
San Jacinto	0	---	7.5	6.5 – 7.5
San Andreas	5	NE	8.25	6.8 – 8.0
Cucamonga	13	NW	6.5	6.0 – 7.0
Elsinore	22	SW	7.5	6.5 – 7.5
Newport-Inglewood	48	SW	7.0	6.0 – 7.4

Figure 4.4 (Source: Southern California Earthquake Data Center.)

Four faults are located within the limits of the Planning Area. They include the San Jacinto Fault, the Loma Linda Fault, the Banning Fault and the Reche Canyon Fault. The San Jacinto Fault zone crosses the southwest portion of the City and has been the most historically active fault zone in Southern California. There are numerous offset gullies, linear ridges, and other fault-related features that indicate active faulting along the Claremont branch of the San Jacinto Fault. The Loma Linda Fault has been mapped as crossing the northern portion of the Planning Area. This fault was originally identified from groundwater data and lacks topographic evidence. No evidence



of active faulting has been identified. The Live Oak Canyon Fault is a trace of the San Andreas Fault, extending westward from the San Geronio Pass. This fault is not generally thought to be active within the Planning Area. The Banning Fault extends through the north eastern quadrant of the City and also is generally thought to be inactive. The Reche Canyon fault traverses the southwest corner of the City and is considered a potentially active fault.

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo) was passed in 1972 to mitigate the hazard of surface faulting to structures built for human occupancy. The Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. This law required the State Geologist to establish regulatory zones (Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps, which are then distributed to affected Cities, Counties, and State agencies for use in planning and/or regulating new or renewed construction in such zones. No habitable structure is permitted across the known trace of any active fault. Setback zones (generally 50 feet on either side of the fault trace) are established for habitable structures. The width and location of any required setback is dependent on the geology a particular site, the characteristics of the fault, and the degree of certainty on the fault's location. The Seismic Hazards Mapping Act of 1990 became law in 1991. The purpose of this Act is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failures, or other hazards caused by earthquakes. The 1990 Act is a companion and complement to the Alquist-Priolo.

The San Jacinto Fault, considered to be active, has been mapped in the southern portion of the Planning Area. An earthquake hazard zone has been established along the trace of this fault. Investigations of the San Jacinto Fault have recommended building setbacks varying from 50 to 100 feet.

The strength of seismic ground shaking at any given site is a function of many factors. Of primary importance is the size of the earthquake, its distance, the paths the waves take as they travel through the earth, the rock or soils underlying the site, and topography (particularly whether a site sits in a valley, or atop a hill). The amount of damage also depends on the size, shape, age, and engineering characteristics of the affected structures. Of the earthquake faults in the Planning Area, only the San Jacinto Fault is considered active and, due to this designation, an earthquake hazard zone has been established along the trace of this fault. The largest earthquake expected in an area under the current tectonic environment is termed to be the maximum credible earthquake (MCE). Using the Richter scale, the MCE for the San Jacinto Fault is 7.5.

Liquefaction occurs primarily in saturated, loose, fine-to-medium-grained soils in areas where the groundwater table is within 50 feet of the surface. Shaking suddenly increases pore water pressure, causing the soils to lose strength and behave as liquid. Three groundwater basins underlie portions of the City and include in the northern (Bunker Hill), southwest (Reche Canyon Basin), and eastern (San Timoteo Basin). Local faults form the boundaries of these underground water reservoirs. There is a moderate to moderately high susceptibility for liquefaction hazards in the northwest portion of the City and the southern reaches of Reche Canyon. The north-central portion of the City and a canyon extending into the western portion of the City from Reche Canyon are moderately susceptible to liquefaction hazards.



4.2.1.1 Earthquake Historical Events

Landers Earthquake 06/28/1992

The Lander's Earthquake occurred on June 28, 1992, at 4:57 am. It came as a relatively heavy shock at a magnitude of 7.3 on the Richter Scale. The depth of the rupture was estimated to be about 1.1 km deep, and the largest aftershock was the Big Bear Earthquake, which measured 6.4 on the Richter Scale. Approximately \$400,000 worth of damage occurred in Loma Linda.

San Jacinto 1968 04/09/1968

The San Jacinto Fault extends more than 125 miles, from northwest of El Centro to northwest of San Bernardino. This fault passes through the intersection of Interstate Highways 10 and 215, Loma Linda, the Box Springs Mountains across Highway 60, to the northern end of the San Jacinto Valley. The San Jacinto Fault also interacts with the close by San Andreas Fault. The faulting displayed by the San Jacinto is of a right-lateral strike-slip type, with a minor right-reverse. As mentioned above, this fault passes through Loma Linda, approximately 3 miles of it traverses Loma Linda southwest quarter in a southeasterly direction. The San Jacinto Fault is approximately 1500 feet wide (or 1/4 mile). The most recent surface rupture occurred on April 9, 1968, on the Coyote Creek segment, and was measured at 6.5 magnitude. The time interval between surface ruptures in the 6.5 and 7.5 range between 100 and 300 years per segment. This fault can produce probable magnitudes in the 6.5 to 7.5 range.

San Andreas Fault 01/09/1857

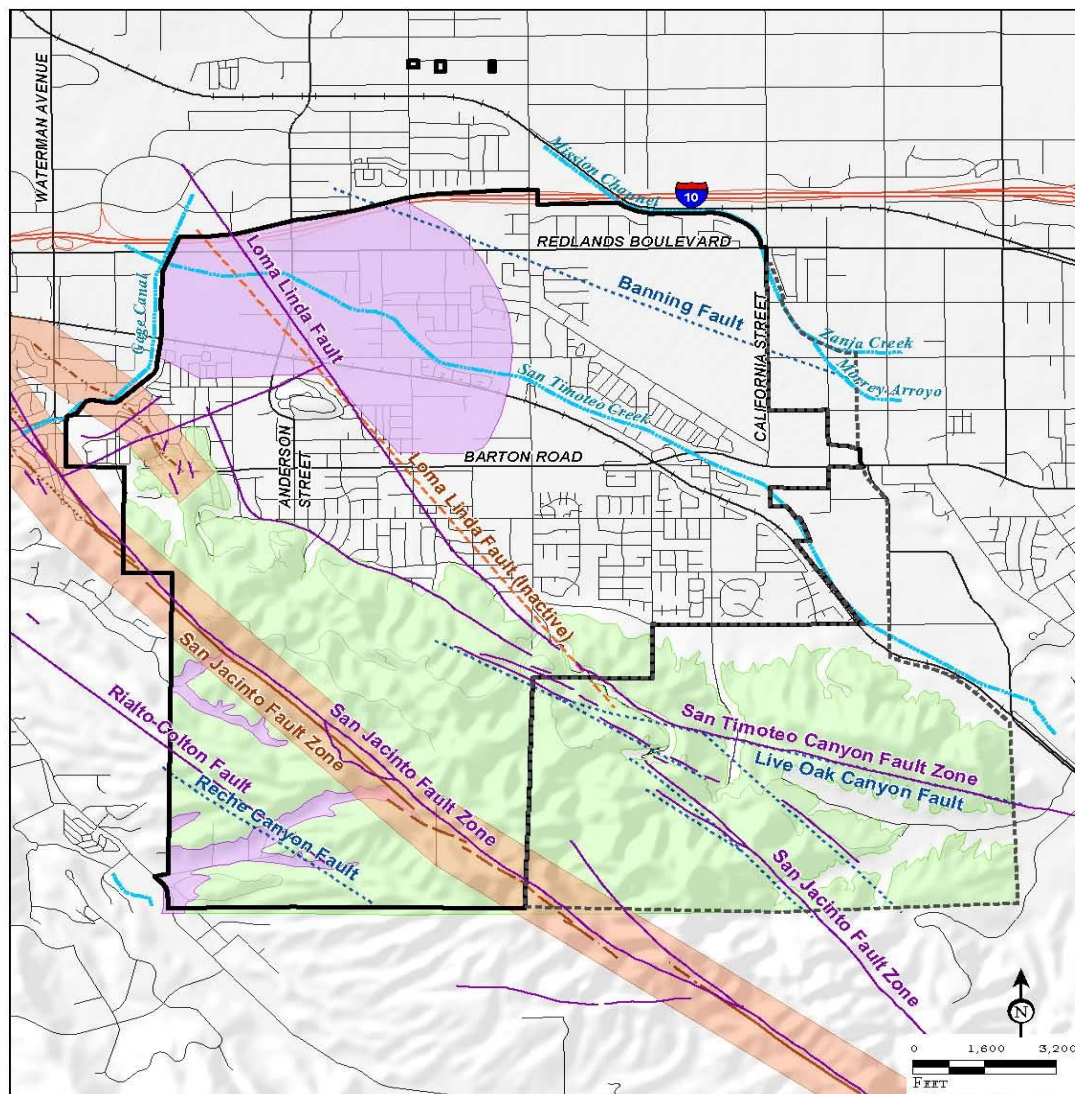
The San Andreas Fault can be found east of Loma Linda, running along the foothills of the San Bernardino Mountains. The length of this fault is 1200 km. The last rupture in Southern California occurred on January 9, 1857, on the Mojave segment, near Fort Tejon). The time interval between major ruptures on the Mojave segment typically averages 140 years. The recurrence interval varies greatly, from under 20 years (at Parkfield) to over 300 years. This fault can produce probable magnitudes between 6.8 and 8.0.

Banning Fault

Another fault that can be found within the City of Loma Linda is the Banning Fault. The faulting displayed by the Banning Fault is a right-lateral strike slip type, with an oblique right reverse, and thrust. The length of the fault is 40 km, 2 1/2 miles of which traverses Loma Linda's southern half in a southeasterly direction. The most recent surface rupture occurred during the Holocene period. The slip rate is uncertain, as this fault is part of a complex system involving the San Andreas Fault. The time interval between major ruptures is uncertain. This fault alone can produce magnitudes between 6.0 and 7.2. The Banning Fault could produce a magnitude 7.0 to 8.0 rupture near the San Andreas Fault.



City of Loma Linda Geologic Hazard Map (Map 4.2)



LSA

Geologic Hazards

- San Jacinto Alquist-Priolo Zone
- Fault, Certain
- Fault, Approximate
- Fault, Concealed

Fault Lines

- Loma Linda Fault
- USGS Faults
- Liquefaction Zones
- Area of Steep Slopes and Slope Instability

JURISDICTIONAL AND INFRASTRUCTURE

- City Boundary
- City Sphere of Influence
- Railroad
- Water Ways

FIGURE 10.1

SOURCE: Safety Element of the April 1, 1991 General Plan, Rick Engineering Company; California Geological Survey, 2002; USGS 30x60 San Bernardino Geologic Map, 2003; Thomas Bros 2009
*Branch Fault Lines are not all named per the USGS Geologic Maps 2003
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City of Loma Linda General Plan
GEOLOGIC HAZARDS



4.2.2 Wildfires

The presence of human activities in or near a wildland area dramatically increases the risk of a major fire due to careless smokers, illegal campfires, off-road vehicles, and other related risks. Present wildfire-fighting techniques are designed to control wildland fire where the optimum place, response time, and equipment/resources for control can be chosen. Residential development intrusion into the lower foothills to the south and southwest creates additional problems in controlling a wildland fires due to limited firefighting facilities and lack of direct access to the areas, which lengthens response times. The hazardous fire areas remain the same as in the 2005 HMP. The *Urban Wildland Division Line/Hazardous Fire Area Map (Map 4.3)* depicts the hazardous fire areas as identified in the 2009 General Plan. The *CAL FIRE Fire Hazard Severity Zone Map (Map 4.4)* shows the fire zones identified by Cal Fire. There have been no repetitive losses.

4.2.2.1 Wildfires Historical Events

The "South Hills" have experienced the following wildfires:

2001-one wildfire

1999-two wildfires

1998-seven wildfires

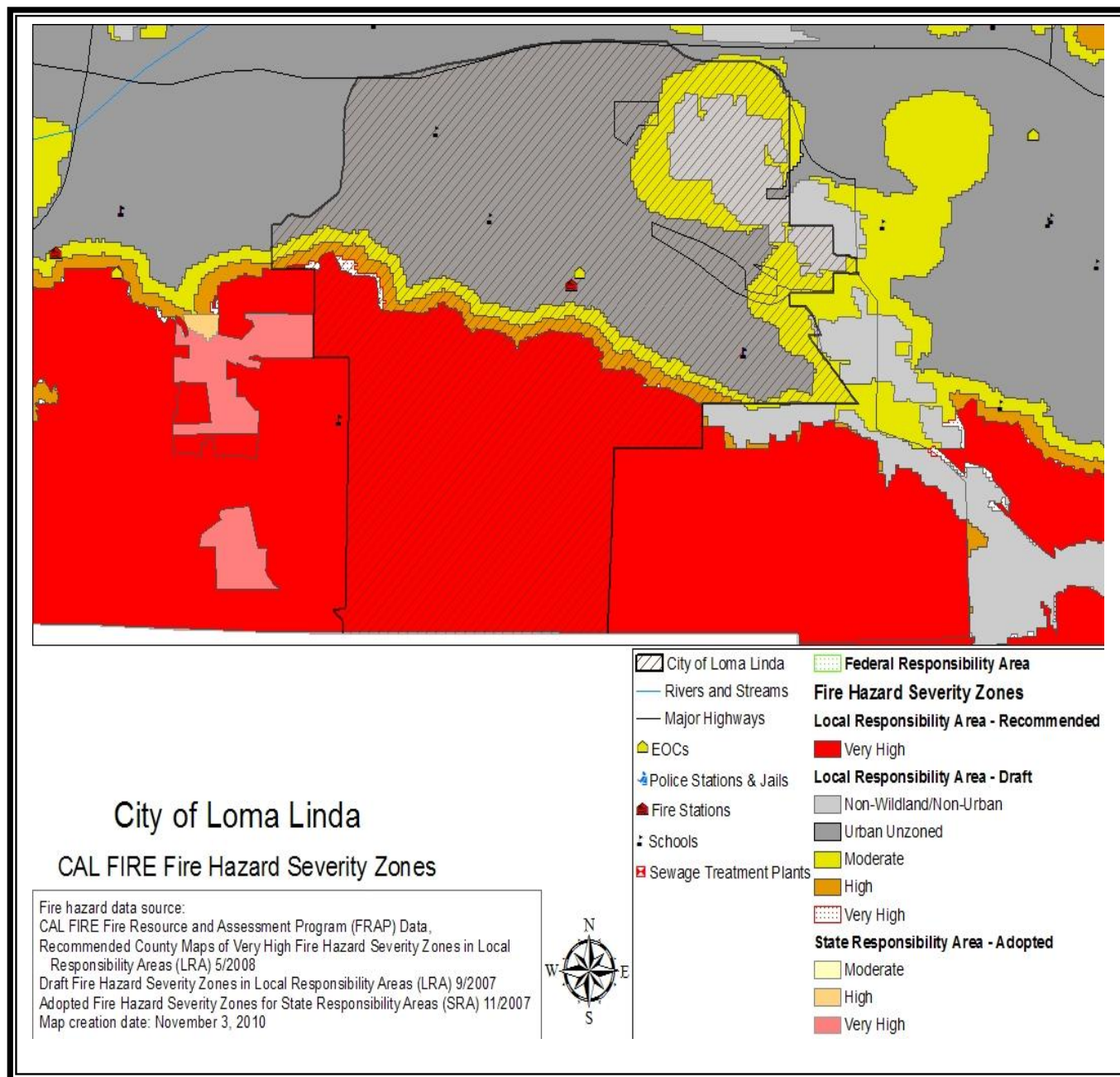


City of Loma Linda Urban Wildland Division Line/Hazardous Fire Area Map (Map 4.3)





CAL FIRE Fire Hazard Severity Zones Map (Map 4.4)





4.2.3 Flooding

Flooding represents a potential hazard to citizens and property within the Planning Area. Flooding hazards may be considered in two categories: natural flooding and reservoir or water tank failure. While the majority of the area is potentially subject to flood hazards located in the northern portion of the Planning Area, local topography and the presence of a number of large aboveground water storage tanks, increase the potential for flood events in other portions of the Planning Area. However, there are no repetitive loss areas.

The principal types of flood hazards in the City include stream flooding, bridge scour, dam inundation and earthquake-induced flooding (seiches). The City is potentially vulnerable to flooding associated with San Timoteo Creek, Mission Channel, and the Santa Ana River, as well as small-scale floods originating on hillsides in the southern portion of the City. While not likely to occur in the City, bridge foundations are vulnerable to scouring during a flood. Major roadways that cross over watercourses/channels in the City include Anderson Street and Barton Road (San Timoteo Creek), and Redlands Boulevard (Mission Channel), and Beaumont Avenue (San Timoteo Creek). The northern portion of the City is within the inundation area of the Seven Oaks Dam, the failure of which while not likely, would impact the City and its Sphere of Influence. The Seven Oaks Dam is a dry dam that serves to decrease peak water flows during spring runoff and rainstorm events. Upon filling, the dam water is "metered out" through a culvert located at the base of the dam. Additionally, canals, levees, and flood control channels may be vulnerable to the earthquake-induced effects of liquefaction, lateral spreading and primary fault rupture. In Loma Linda, an earthquake may cause local flooding by creating seiches (reverberating waves) by damaging water storage facilities or detention basins which are located generally in the southern foothills. The flood zones are the same as in the 2005 HMP. The *Flood Hazard Area Map* (Map 4.5) displays the flood areas as described in the 2009 General Plan.

The most widely distributed flood map product is the Flood Insurance Rate Map (FIRM). The Federal Emergency Management Agency (FEMA) is mandated by the Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 to evaluate flood hazards and provide FIRMs for local and regional planners to further promote sound land use and floodplain development. Flood risk data presented on FIRMs are based on historic, meteorological, hydrologic, and hydraulic data, as well as open space conditions, flood control works, and development. To prepare a FIRM that illustrates the extent of flood hazards in a flood-prone community, FEMA conducts an engineering study referred to as Flood Insurance Study (FIS). Using information gathered in these studies, FEMA engineers and cartographers delineate Special Flood Hazard Areas (SFHAs) on FIRMs. SFHAs are those areas subject to inundation by a flood that has a one percent or greater chance of being equaled or exceeded during any given year.

The City of Loma Linda participates in the National Flood Insurance Program (NFIP). Basic NFIP actions include:

- Adoption and enforcement of floodplain management requirements, including regulating all and substantially improved construction in Special Flood Hazard Areas.
- Floodplain identification and mapping, including any local requests for map updates.
- Description of community assistance and monitoring activities.

There are no repetitive loss properties located in the City of Loma Linda. Repetitive loss properties are defined as "A property that is currently insured for which two or more NIFP losses (occurring more than ten days apart) of at least \$1000 each have been paid within any 10-year period since 1978."



FIRM maps prepared by FEMA also show potential flood zones within the City limits. Flood hazard areas and flood control facilities in the City are shown on Map 4.4. As depicted on FIRM maps, flood hazard areas in the City of Loma Linda are identified in the following manner:

Zone AE. This is one of the seven classifications of areas of special flood hazard areas inundated by the 100-year flood. Within the City of Loma Linda, the AE zone is generally located in the San Timoteo Creek Channel. Base flood elevations have not been determined for this area as it is undergoing channelization.

Zone AO. Areas with this designation have average flood depths of one to three feet. The flooding is usually due to sheet flows on sloping terrain. The area with this designation is located in the sphere of influence around the Mission Channel south of Redlands Boulevard.

Zone A99. Areas so designated are those where the partial completion of a flood control project (e.g., the San Timoteo channelization project) has reduced but not yet eliminated the possibility of flooding in the area. The A99 designation adjacent to the San Timoteo Channel became effective June 27, 2001. In the City of Loma Linda, the A99 zone is generally located between I-10 to the north and the UPRR line to the south, and it extends from California Street on the east to the western boundary of the City. Remapping of this area for flood hazards will occur after the completion of the channelization project.

Zone X (shaded). Identified as the areas of the 500-year flood; areas of the 100-year flood with an average depth of less than one foot or with drainage areas of less than one square mile; and areas protected by levies from the 100-year flood. Within the City, the X zone is primarily restricted to areas at the extreme southern and northern limits of the AE zone. Two areas: one north of Redlands Boulevard between California Street and Rhonda Street, and the other, north of the UPRR line at the western City boundary are also located within this zone.

Zone X (unshaded). Areas determined to be outside the 500-year floodplain. All areas of the City not identified within Zones AE or X (unshaded) are included under this designation.

Slope Failure

"Slope" is defined as the vertical change in elevation over a given horizontal distance. A 10 percent slope is one that rises 10 feet over a horizontal distance of 100 feet. Hillsides, generally speaking, can be unstable platforms for development. Unless a landslide is already occurring, a steep slope can generally be thought of as existing in a state of equilibrium. When this equilibrium is disturbed, the likelihood of slope failure, soil erosion, silting of lower slopes, and downstream flooding increases.

Slope stability is dependent on rock type, pore water pressure, and slope steepness due to natural or man-made undercutting. Every slope has an angle of repose and slopes less than this angle can resist the pull of gravity and will be at rest. Slopes steeper than this angle will eventually fail. On average, the angle of repose is 35 degrees from horizontal, but varies widely. The looseness or consolidation of the material, planes of weakness and vegetative cover all affect angles of repose.

The southern portion of the City (the Badlands and South Hills) has steep natural slopes, which are susceptible to instability. The general area where slope instability may impact development is in the southern hillside area of the City. The type of instability anticipated in this area includes deep-seated landslides, surficial soil slips, wet debris flows, and surficial creep. Most of these mapped landslides appear to be relatively recent (less than 11,000 years). Other deep-seated landslides, smaller in size and not as geomorphically pronounced, are suspected to exist in the steep terrain of the southern portion of the City.



4.2.3.1 Flooding Historical Events

December 2010 Winter Storms

From mid December 2010 thru approximately December 22, 2010, the City experienced high rainfall amounts causing flooding and mudflows in the foothills which overflowed onto approximately 2/3 of city streets damaging homes, businesses, and City property. The Fire Department successfully completed 20 swift water rescues, City personnel responded to work in the Emergency Operations Center, and Public Works worked on clearing streets by Christmas Eve. A week following the floods, the City also experienced high winds causing trees to fall. The wind event damage was part of the "winter storm" costs. The cost of the winter storm damage was approximately \$2,370,000.00.

Winter Storms Jan./Feb. 2010

From January 17 – February 6 the City experienced heavy rains, high winds, and hail. Protective measures were used to mitigate the storm impact; however, there was still damage to trees and streets throughout the city. The cost of the damage was \$19, 777.66.

Flood of 1969 01/18/1969

A much needed overpass on Anderson street, between the University and Loma Linda Academy, was completed in 1968. Residents found it to be an excellent grandstand to watch the raging waters of San Timoteo Creek. Debris-laden water spread across the heavily populated Poplar and Ohio Streets and Seamount Road. Van Leuven was so completely buried in the mud that only the tops of playground in the park could be seen. Loma Linda Academy and Elementary School were flooded and early records were lost. A recently completed Gentry Gym became a first-aid station and emergency shelter. University classes were dismissed so students could assist Job Corps Volunteers with clean-up operations. In the end, nearly two thirds of Loma Linda bore the scars of the flood. Following the flood, the inadequate drainage channel was repaired, but not really improved.

Flood of 1938

The worst flood in history hits the San Bernardino Valley, with rain falling at 4.8 inches an hour. Eighty-seven people die. Foothill Blvd is inaccessible. The Santa Ana River halts traffic across North Orange Street and Tippecanoe Avenue into Redlands and Loma Linda. One hundred bridges in San Bernardino are destroyed.

Flood of 1916 01/01/1916

Seventh-day Adventists purchased the hotel on the hill in 1905 and converted it into a Sanitarium. The Sanitarium, an impressive four story wood structure, stood on the north end of the mound. At the foot of the hill, Southern Pacific had placed a main railroad line, which served the Los Angeles region. In order to run the railroad tracks, they had to divert San Timoteo Creek to the north. The Creek then drained into the Santa Ana river. Between the railroads track and the diverted creek various cottages had been built which were owned by the Sanitarium and private individuals. In 1916 rainfall was more abundant than usual and the entire area was flooded. Water surrounded all the buildings in the area, and deposited about two feet of silt throughout the area. The water was deep enough to require rescue work.

Flood of 1862 01/22/1862

In November 1861, rain began falling in southern California and continued for 15 days, saturating the ground. That was followed by a period of relatively dry weather until the 24th of December. On the 24th, the rain started again and continued for 30 days with only two brief interruptions. By the



third week of January 1862 the basin had received at least three times the rainfall of a normal season. Some areas recorded twenty inches of rainfall between the 18th and 19th alone. On the 22nd of a January, east of the Santa Ana Mountains, a flash flood occurred at Agua Mansa. All structures except the church and a store were wiped out and flooding continued in the region for another 15 days. Peak discharge at Riverside Narrows was 317,000 cubic feet per second (cfs). At Agua Mansa, the town and trees were gone and a layer of sediment covered everything, including the springs. Further northeast, near the confluence of San Timoteo Creek with the Santa Ana River, considerable floodplain deposit and damage occurred. The flood of 1862 deposited approximately 6 feet of sediment on the Loma Linda floodplain. The flood damaged or destroyed 400 homes, 300 vehicles, 5 bridges, and 1 school in the area.. The El Nino related flood also damaged the primary Southern Pacific Railroad line south of Redlands City.



City of Loma Linda Flood Hazard Area Map (Map 4.5)

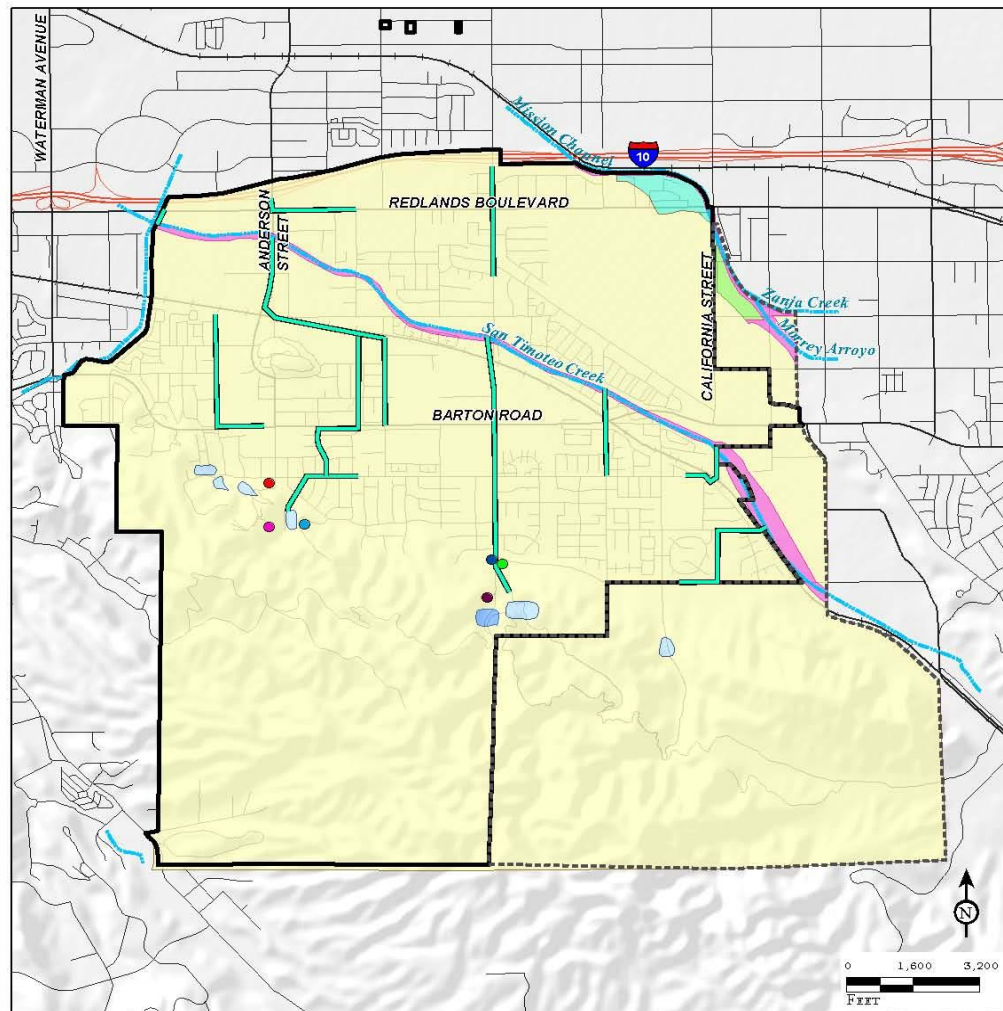


FIGURE 10.2

LSA

Flood Zones*

- Zone A
No base flood elevations determined, contained within channel
- Zone AO - Flood Depths of 1-3 ft
- Zone X - 100 to 500 yr
Areas of 100 yr flood with average depths of less than 1 foot

- Zone X - 500 yr or greater
Areas determined to be outside the 500 yr floodplain
- Existing Detention Basin
- Proposed Detention Basin
- Major Storm Drains

Water Tanks

- Water Tank - 3.2MG
- Water Tank - 8.0MG
- Water Tank - 2.0MG
- Water Tank - 0.6MG
- Water Tank - 1.0MG
- Water Tank - 0.1MG

Jurisdictional and Infrastructure

- City Boundary
- City Sphere of Influence
- Railroad
- Water Ways

*Flood Zone AE is located within the confines of the San Timoteo Creek Channel
SOURCE: FEMA DFIRM, 2008; Thomas Bros 2009
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City of Loma Linda General Plan
**FLOOD HAZARD AREAS AND
FLOOD CONTROL FACILITIES**



4.3 Inventory Assets

The third step in the Risk Assessment process is to describe the various assets exposed to the identified hazards, including residential, commercial and industrial buildings throughout the impacted area, essential facilities, as well as critical infrastructure.

4.3.1 Population

There are approximately 21,000 residents; however, the daytime population can rise to almost 60,000 people due to the employment, students, and healthcare that these facilities attract.

4.3.2 Buildings

Regional building inventory databases were used to analyze the building inventory for the following tables which were developed from County Assessor's data, under FEMA funding, as part of the San Bernardino County Essential Facilities Risk Assessment (SBEFRA) Project completed in 2009. The SBEFRA project report may be downloaded from: <http://www.fema.gov/library/viewRecord.do?id=3804>

The table below (*Figure 4.5*) summarizes the number and value of structures in the City by "general occupancy class" listing the building inventory, building replacement value, contents replacement value, building square footage, and building count. This information is necessary to generate the loss estimations.

Building Inventory Information by General Occupancy

Building Inventory Information by General Occupancy	Building Replacement Value (\$1,000)	Contents Replacement Value (\$1,000)	Building Square Footage (1,000 Sq. Ft.)	Building Count
Residential	\$1,375,594	\$687,796	12,521	5,914
Commercial	\$512,339	\$636,511	3,823	130
Industrial	\$14,024	\$21,036	186	12
Other	\$83,360	\$71,367	411	79
TOTAL	\$1,985,317	\$1,416,710	16,941	6,135

Figure 4.5

The table below (*Figure 4.6*) displays the number and value of structures in the City by "general building type" by listing the building replacement value (by dollars and percent), estimated building count, and percent of building count.



Selected Building Inventory Data by General Building Type

Selected Building Inventory Data by General Building Type	Building Replacement Value (\$1,000)	Building Replacement Value (%)	Estimated Building Count	% of Building Count
Concrete	\$95,887	4.8%	32	1%
Manufactured Housing	\$15,867	0.8%	406	7%
Precast Concrete	\$74,517	3.8%	25	0%
Reinforced Masonry	\$157,387	7.9%	67	1%
Steel	\$91,868	4.6%	21	0%
Unreinforced Masonry	\$7,095	0.4%	2	0%
Wood Frame (Other)	\$478,852	24.1%	296	5%
Wood Frame (Single-family)	\$1,063,844	53.6%	5,286	86%
TOTAL	\$1,985,317		6,135	

Figure 4.6

4.3.3 Essential Facilities

The Essential Facility List includes facilities that are necessary to remain in operation during and immediately after a catastrophic event. This list remains the same as the 2005 HMP except for an additional Fire Station built in 2009. The types of essential facilities are as follows:

- Jerry L. Pettis VA Medical Center
- Loma Linda University Medical Center (LLUMC)
- LLUMC Children's Hospital
- LLUMC Behavioral Medicine Center
- LLUMC East Campus Hospital
- LLUMC Heart and Surgical Hospital
- City Hall (Includes EOC and Police Dept.)
- Fire Station 251
- Fire Station 252



4.4 Vulnerability Assessment

The vulnerability assessment assesses the highest priority hazards (earthquake, fire, flood) and their impact to the population and buildings.

4.4.1 Earthquake Results

The following table (Figure 4.7) summarizes citywide earthquake loss estimates, critical facility damage, and functionality have been estimated using the latest version of HAZUS (HAZUS-MH MR-4). This includes the improved regional building and essential facility inventory databases developed under FEMA funding for the San Bernardino County Essential Facilities Risk Assessment (SBEFRA) Project.

Earthquake Loss Estimates

		Earthquake Scenario		
		M7.8 ShakeOut Scenario (including Liquefaction)	M6.7 San Jacinto Fault (including Liquefaction)	M6.7 Chino Hills Fault (including Liquefaction)
Direct Economic Losses for Buildings (\$1,000)				
	Total Building Exposure Value	1,985,317		
Capital Stock Losses	Cost of Structural Damage	52,995	27,611	160
	Cost of Non-Structural Damage	239,182	122,670	1,659
	Total Building Damage (Str. + Non-Str.)	292,177	150,282	1,819
	Building Loss Ratio %	14.7%	7.6%	0.1%
	Cost of Contents Damage	97,404	48,646	826
	Inventory Loss	1,158	551	10
Income Losses	Relocation Loss	33,704	18,833	46
	Capital-Related Loss	30,318	15,263	30
	Rental Income Loss	19,082	9,488	34
	Wage Losses	48,372	24,431	45
	Total Direct Economic Loss	522,215	267,494	2,810
	% Of Countywide Loss	2.4%	5.3%	0.1%
Casualties				
Day Casualties	Casualties - 2 pm			
	Fatalities	7	2	0
	Trauma injuries	2	1	0
	Other (non-trauma) hospitalized injuries	13	7	0
	Total hospitalized injuries	15	8	0
	Injuries requiring Emergency Department Visits	316	112	0
	Injuries treated on an Outpatient basis	548	205	1
	Total injuries	886	327	1



	Hospital visits requiring EMS transport	24	7	0
Night Casualties	Casualties - 2 am			
	Fatalities	2	1	0
	Trauma injuries	1	0	0
	Other (non-trauma) hospitalized injuries	7	0	0
	Total hospitalized injuries	8	0	0
	Injuries requiring Emergency Department Visits	228	104	1
	Injuries treated on an Outpatient basis	414	195	1
	Total injuries	652	300	2
	Hospital visits requiring EMS transport	15	6	0
Shelter				
Shelter	Number of Displaced Households	1,039	533	0
	Number of People Requiring Short-term Shelter	372	186	0
Debris (thousands of tons)				
Debris	Brick, Wood & Other (Light) Debris	42	24	< 1
	Concrete & Steel (Heavy) Debris	75	30	< 1
	Total Debris	117	54	< 1
Building Damage Count by General Building Type				
Concrete	None	4	6	31
	Slight	8	11	0
	Moderate	8	10	0
	Extensive	6	5	0
	Complete	6	1	0
	TOTAL	32	32	32
Manuf. Housing	None	0	0	280
	Slight	0	1	102
	Moderate	0	28	24
	Extensive	10	191	0
	Complete	396	186	0
	TOTAL	406	406	406
Precast Concrete	None	4	5	25
	Slight	11	11	1
	Moderate	9	8	0
	Extensive	1	2	0
	Complete	0	0	0
	TOTAL	25	25	25
Brick Masonry	None	22	20	66
	Slight	23	25	1



	Moderate	15	16	0
	Extensive	6	5	0
	Complete	1	1	0
	TOTAL	67	67	67
Steel	None	1	2	21
	Slight	3	7	0
	Moderate	8	9	0
	Extensive	6	3	0
	Complete	3	0	0
	TOTAL	21	21	21
Unreinforced Masonry	None	0	0	2
	Slight	0	0	0
	Moderate	0	0	0
	Extensive	0	1	0
	Complete	2	1	0
	TOTAL	2	2	2
Building Damage Count by General Building Type (Continued)				
Wood Frame (Other)	None	62	71	290
	Slight	104	112	6
	Moderate	48	66	0
	Extensive	23	40	0
	Complete	60	7	0
	TOTAL	296	296	296
Wood Frame (Single-family)	None	2,361	1,794	5,222
	Slight	2,553	2,863	63
	Moderate	352	402	0
	Extensive	20	183	0
	Complete	1	44	0
	TOTAL	5,286	5,286	5,286
ALL BUILDING TYPES	None	2,455	1,898	5,937
	Slight	2,702	3,029	174
	Moderate	440	538	25
	Extensive	71	429	0
	Complete	468	241	0
	TOTAL	6,135	6,135	6,135

Figure 4.7



4.4.2 Wildfire Results

The following information displays the 2005 potential losses due to wildfires confronting the community. However, due to slow growth in the City, this data is still pertinent.

Summary of Economic Losses:

- a. The economic loss resulting from wildfires is approximately \$10,000
- b. The loss from damage to structures from wildfires is approximately \$6,000,000
- c. The following is a description of the estimated losses: Structural damage to houses directly adjacent to, or intermixed with, the Hazardous Fire Area.

Summary of Human Losses

- a. There is no estimated number of fatalities resulting from wildfires.
- b. The estimated number of injuries resulting from wildfires is approximately 2.
- c. The estimated number of displaced people resulting from wildfires is approximately 50
- d. Total number of people affected: 52
- e. Percent of community's population at risk: 0.25%

4.4.3 Flooding Results

The following information displays the 2005 potential losses due to flooding confronting the community. However, due to slow growth in the City, this data is still pertinent.

Summary of Economic Losses:

- a. The economic loss resulting from this hazard is approximately \$250,000
- b. The loss from damage to structures from this hazard is approximately \$500,000
- c. The following is a description of the estimated losses:

Flood damage to the LLU wells would have a temporary impact on the ability of the system to provide pure, clean water to LLU and LLUMC. However, the tie-ins with the City of Loma Linda's water system would minimize the impact to the time it takes for the appropriate personnel to isolate the LLU water supply and activate the supply from the City.

Loma Linda Academy lies directly adjacent to the San Timoteo Creek channel, and has suffered severe damage from flooding in the past. In the case of another major flood, which overflows the limits of the concrete channel, the school would again suffer major damage and disruption to school activities.

Summary of Human Losses

- a. The estimated number of fatalities resulting from this hazard is approximately 0
- b. The estimated number of injuries resulting from this hazard is approximately 5
- c. The estimated number of displaces resulting from this hazard is approximately 1000
- d. Total number of people affected: 1005
- e. Percent of community's population at risk: 4.79%



Section 5 Community Capability Assessment

This section describes the resources and tools the City has in place that can assist, promote, and implement mitigation actions in the community.

5.1 Agencies and People

The table below (*Figure 5.1*) displays City Departments, agency, or organizations that are involved in promoting or implementing mitigation and risk reduction activities.

Agencies and People Involved with Mitigation and Risk Reduction

City Departments and Other Agencies	Role in Disaster Mitigation and Management
Mayor and City Council	<ul style="list-style-type: none">• Adopts policies, codes and standards and approves plans.• Comprise the Disaster Council.
Fire Department	<ul style="list-style-type: none">• Ensure emergency response equipment is in working order.
Emergency Services	<ul style="list-style-type: none">• Coordinates CERT Program.• Coordinates RACES Program.• Conducts Community Disaster Preparedness Meetings.
Police Department	<ul style="list-style-type: none">• Coordinates VIPS program.
Community Development	<ul style="list-style-type: none">• General Plan, land use regulations, environmental assessments.• Regulates construction and occupancy of all residential, commercial and industrial buildings in order to ensure life, fire, and health safety.• Conducts post-disaster safety assessments.
Public Works	<ul style="list-style-type: none">• Provides leadership, planning, and administration of all public works programs, including engineering for capital projects.• Conducts post-disaster safety assessments.• Coordinates mitigation programs and projects.
IT	<ul style="list-style-type: none">• Ensure technical readiness of Emergency Operations Center.• Collects, maintains and provides digital mapping services.
Finance	<ul style="list-style-type: none">• Establishes vendor resources list for disaster response.
Loma Linda University	<ul style="list-style-type: none">• Collaboration with City and other agencies in emergency preparedness.
Loma Linda University Medical Center	<ul style="list-style-type: none">• Collaboration with City and other agencies in emergency preparedness.• Conduct emergency exercises/drills.• Develops Emergency Operations Plans for each of its facilities.• Stores emergency caches for Medical Center personnel.
Chamber of Commerce	<ul style="list-style-type: none">• Collaboration with City and other agencies in emergency preparedness.
American Red Cross	<ul style="list-style-type: none">• Provides support in emergencies.• Provides training for citywide mass care and sheltering.
Community Based Organizations (i.e., churches, community organizations)	<ul style="list-style-type: none">• Collaboration with City and other agencies in emergency preparedness.

Figure 5.1



5.2 Existing Plans

The City of Loma Linda has adopted the philosophy that Plan integration is an essential element to future and long-term community sustainability. The City's long-term goal is to integrate all aspects of comprehensive planning and development to correlate with a continuum of adopted codes and standards to support this philosophy. Current and future Plans will define important City policies and support the ordinances and activities described below. For example, the goal is to enhance the objectives of hazard mitigation, including the Health and Safety Element of the General Plan. Other Plans focus on different aspects of disaster management such as emergency response. Other Plans have implications that are relevant to hazard mitigation, such as plans related to spending on public facilities and storage of hazardous materials. These plans are listed below:

- 2009 General Plan
- Emergency Operations Plan
- Urban Water Management Plan
- Master Plan of Drainage
- Capital Improvement Program (CIP)
- Mutual Aid Agreements

5.3 Regulations, Codes, Policies, and Ordinances

The following titles of the City of Loma Linda Municipal Code (<http://qcode.us/codes/lomalinda/>) include regulations and ordinances on the following issues and topics related to hazard mitigation:

Title 2 Administration and Personnel

Emergency and Disaster Organization
Fire Department

Title 3 Revenue and Finance

Fire Protection Charges and Assessments

Title 8 Health and Safety

Underground Storage of Hazardous Substances

Title 9 Public Peace, Morals and Welfare

Administrative Code for Enforcement Remedies

Title 12 Streets and Sidewalks

Underground Utilities

Title 13 Water and Sewers

Water Rules and Regulations
Wastewater Facilities Regulations
Drainage Plan



Title 15 Buildings and Construction

Building Code and Building Code Standards

Electrical Code

Plumbing Code

Mechanical Code

Fire Code

Wildland-Urban Interface Code

Fire Zones

Safety Assessment Placards

Conditions for Building Permits

Repair of Damaged Structures

Title 17 Zoning

All chapters listed within code.

Title 19 Development Restrictions

Hillside Area Development

Flood Control Measures

Residential and Hillside Development Control Measure

Title 20 Environmental Protection

Environmental Health Code

Environmental Impact Reports

Environmental Quality Act

Hillside Areas Preservation

5.4 Mitigation Programs and Guiding Policies

This section describes the City's 2009 General Plan guiding policies for the highest priority hazards (earthquake, fire, flood). This will help facilitate the implementation of local mitigation strategies. These policies and activities may not actually use PDM, HMGP, or FMA funding, but they display how the city is being pro-active in hazard mitigation. Actual mitigation projects can be found in Section 6.3, *Mitigation Goals, Objectives and Projects*.

5.4.1 Earthquakes

Earthquake Guiding Policy

Minimize the risks of property damage and personal injury resulting from seismic and geologic hazards.

Implementing Policies

a. Limit development to low density in areas near geologic hazards such as the San Jacinto Fault that would create adverse conditions to those inhabiting the area and to the overall community.

b. Enforce the provisions of the Alquist-Priolo Earthquake Fault Zoning Act.



- c. Require geologic and soils reports to be prepared for proposed development sites, and incorporate the findings and recommendations of these studies into project development requirements.
- d. Provide information and establish incentives such as free inspections or possibly reduced fees for property owners to rehabilitate existing buildings using construction techniques to protect against seismic hazards particularly in buildings with high occupancy such as churches and other places of assembly.
- e. Identify and publicize the geologic and seismic hazards within Loma Linda and advise residents and property owners of appropriate protection measures to reduce or eliminate structural damage.
- f. Encourage continued investigation by State agencies of geologic conditions within the Inland Empire to update knowledge of seismic hazards and promote public awareness.
- g. Require that engineered slopes be designed to resist seismically induced failure.
- h. Require that structures overlying both cut and fill areas within a grading operation be over excavated to mitigate the potential for seismically induced differential settlement.
- i. Require specialized soils reports in areas suspected of having problems with potential liquefaction and areas depicted as liquefaction zones as shown on *Figure 10.1 (Geologic Hazards)*, bearing strength, expansion, settlement, or subsidence, including implementation of the recommendations of these reports into the project development.
- j. Work with Southern California Edison, the Southern California Gas Company, pipeline companies, and industrial companies to implement measures to safeguard the public from seismic hazards associated with high voltage transmission lines, caustic and toxic gas and fuel lines, and flammable storage facilities.

5.4.2 Wildfires

Wildfire Guiding Policy

Minimize the threat to persons, property, and the environment resulting from wildfires.

Implementing Policies

- a. Require fire protection agency review of all development in high fire risk areas and minimize risks accordingly.
- b. Require new development in areas of high wildfire hazard to utilize fire-resistant building materials. As appropriate, require on-site fire suppression systems, including, automatic sprinklers, buffers and fuel breaks, and fire retardant landscaping.
- c. Require detailed fire prevention and control measures, including, community firebreaks, for development projects in high fire hazard zones.
- d. Require fire sprinklers in all structures greater than 200 square feet.
- e. Prohibit single-access neighborhoods in high fire hazard areas. Provide adequate access for fire and other emergency response personnel and vegetation management program



5.4.3 Floods

Flood Guiding Policy

Protect the community from risks to lives and property created by flooding and storm water runoff.

Implementing Policies

- a. Through the San Bernardino County Flood Control District Citizen's Advisory Committee, continue to make recommendations to the County Board of Supervisors for improvements to the flood control facilities in the City of Loma Linda to reduce the potential of 100 – 500 year floods within the City.
- b. In areas where local and sub-regional drainage facilities are not currently provided, require new development to prepare hydrologic studies to assess storm runoff on the local and sub regional storm drainage systems and/or creek corridors and incorporate appropriate mitigation in project development.
- c. Require new development to provide for the perpetual maintenance of detention basins, if necessary to support the new development.
- d. Require new development to incorporate features into drainage plans that would reduce impermeable surface area, increase surface water infiltration, and minimize surface water runoff during storms.
- e. Cooperate with the State and Federal agencies to encourage that streams and creeks in the south hills area be left in their natural state in order to preserve their value as percolation and recharge areas, natural habitat, scenic resources, and recreation corridors, if technically and financially feasible. If not, then the loss or modification of a creek stream should be appropriately mitigated.
- f. Cooperate with San Bernardino County Flood Control District to reduce hazards caused by local flooding through maintenance and improvements to the area's storm drain system such as the jointly maintained Loma Linda storm drain.
- g. Maintain current flood hazard data, and coordinate with the Federal Emergency Management Agency, San Bernardino Flood Control District, U.S. Army Corps of Engineers, and other responsible agencies to coordinate flood hazard analysis and management activities.

5.5 Fiscal Resources

As in 2005, the fiscal resources available to the City to complete mitigation projects are federal and state grant programs, and local City General Funds.



Section 6 Mitigation Strategies

6.1 Overview

The Mitigation Strategy is derived from the review of the existing vulnerabilities (Risk Assessment) and capabilities (Community Capability Assessment) outlined in previous sections of this Plan. It is the long-term approach for reducing and/or eliminating the potential losses identified in the Risk Assessment section.

6.2 Mitigation Projects 5-Year Progress Report

The table below, *Figure 6.1*, displays the status of the four (4) mitigation projects described in the City's 2005 LHMP.

5-Year Mitigation Project Progress Report

2005 Mitigation Project	2010 Status	Comments
San Timoteo Creek Project: Reach 3B	Completed	Project completed in 2009.
San Timoteo Creek Project: Reach 2	Completed	Project completed in 2009.
Urban-Wildland Interface Fire Project	On-going	Weed abatement activities are an annual process.
Loma Linda University Medical Center: Seismic Retrofit Project	On-going	Unforeseen obstacles have prevented this project from being completed at this time.

Figure 6.1

6.3 Mitigation Goals, Objectives, and Projects

The table below, *Figure 6.2*, describes the City's 2005 HMP mitigation goals and objectives for each of the high priority hazards followed by 2011 mitigation projects. In addition to the listed mitigation projects the city also implements state and federal fire and building codes.

2005/2011 Mitigation Goals and Objectives

High Priority Hazard	2005 Goals	2005 Objectives	2011 Goals	2011 Objectives
Earth-quakes	Reduction of damage caused by a significant earthquake in or near Loma Linda.	Substantially retrofit structures that don't meet current seismic construction standards.	Same	Same
Fire	Prevention or mitigation of damage caused to structures and infrastructure by uncontrolled wildfire.	Require adequate defensible space around all structures. Require building construction features appropriate to the wildfire hazard. Provide education to all homeowners/occupants of dwellings within the Hazardous Fire Area.	Same	Same
Flood	Reduction or elimination of potential damage to structures and infrastructure caused by flooding from the San Timoteo Creek and tributaries.	Channelization of the San Timoteo Creek through the City of Loma Linda, with accompanying development of catch and retention basins upstream (San Timoteo Canyon).	Reduce or eliminate potential damage to structures and infrastructures cause by mudslides.	Slope stabilization and mudslide hazard mitigation.

Figure 6.2



6.3.1 Earthquake Mitigation Projects

Name: Anderson Bridge Seismic Retrofit

Description: To bring bridge up to current earthquake standards.

Strategy:

Status: The City currently has plans and is waiting for CalTrans grant approval.

Completion Date: 90 days or less

Total Cost: \$259,000

Funding Description: Federal Transportation Grant administered by CalTrans

Name: Loma Linda University Medical Center: Seismic Retrofit Project

Description: Seismic structural retrofit of Loma Linda University Medical Center

Strategy: In Progress.

Status: On-going

Completion Date: TBD

Total Cost: TBD

Funding Description: Corporate operating and capital funds, Federal Stafford Act appropriation administered by CA OES.

6.3.2 Fire Mitigation Projects

Name: Urban-Wildland Interface Hillside Weed Abatement

Description: Ensuring that residents and City properties remove and clear away all dead/combustible weeds or other combustible vegetation from all areas of parcels, including slopes, within 100 feet of all buildings or structures on parcel. Combustible weeds should also be removed from the edges of roadways.

Strategy: Develop weed abatement protocol and distribute educational materials to residents.

Status: The Fire Marshal and staff are currently updating weed abatement protocol and meeting with residents.

Completion Date: on-Going

Total Cost: TBD

Funding Description: Fire Department Budget

6.3.3 Flood Mitigation Projects

Name: Zanja Channel Improvement

Description: To improve channel flow in conjunction with the realignment of Redlands Blvd. and California Street project.

Strategy: Include channel improvements during phase 1 of the realignment project.

Status: In planning stages.

Completion Date: TBD

Total Cost: \$6,000,000 (appx.)

Funding Description: TBD



6.4 Mitigation Priorities

Hazard mitigation has been a high priority in the City since its incorporation in 1970. The City has implemented several mitigation projects in the past that has brought the City up to exceptionally safe standards. Currently, because there are four mitigation projects, prioritizing projects is not necessary. However, if we had additional projects the City would use the following methodology to prioritize mitigation projects. The four mitigation projects were described in Section 6.3 of this Plan that all require different funding sources.

To assist in identifying mitigation priorities, the following priority ranking was developed:

- *High Priority* – Projects that will be the primary focus of implementation over the next five (5) years.
- *Medium Priority* – Projects that may be implemented over the next five (5) years.
- *Low Priority* – Projects that will not be implemented over the next five (5) years unless conditions change (i.e., new program, funding sources, etc.)

To assist in validating these priorities, each project received criteria/factor questions to confirm priority levels:

Does the mitigation project:

1. solve the problem?
2. address Vulnerability Assessment?
3. reduce the exposure or vulnerability to the highest priority hazards?
4. address multiple hazards?
5. address more than one (1) Goal/Objective?
6. benefits equal or exceed costs?

Can the mitigation project:

7. be implemented with existing funds?
8. be implemented by existing stated or federal grant programs?
9. be completed within the 5-year life cycle of the LHMP?
10. be implemented with currently available technologies?

Will the mitigation project:

11. be accepted by the community?
12. be supported by community leaders?
13. adversely impact segments of the population or neighborhoods?
14. require a change in local ordinances or zoning laws?
15. result in legal action such as a lawsuit?
16. positively or negatively impact the environment?
17. comply with all local, state, and federal environmental laws and regulations?

Is there:

18. sufficient staffing to undertake the project?
19. existing authority to undertake the projects?



6.5 Implementation Strategy

To assist in implementing the mitigation projects, the *Implementation Strategy* (Figure 6.3) matrix below was developed to identify the strategies that will focus on the 2011 high priority mitigation projects which can be implemented during the 5-year LHMP cycle. The matrix includes the 2011 mitigation project, the responsible lead agency, the hazard being mitigated, funding source, cost (if known), and expected timeframe.

Implementation Strategy

Mitigation Project	Lead Agency	Hazard	Funding Source	Cost	Timeframe
Anderson Bridge Seismic Retrofit	City Public Works	Earthquake	Federal Transportation Grant (CalTrans)	\$259,000	Short-term
Zanja Channel Improvement	City Public Works	Flood	TBD	\$6,000,000	Short-term
Urban-Wildland Interface Hillside Weed Abatement	City Fire Department	Fire	Fire Department Annual Budget	TBD	Long-term
Loma Linda University Medical Center: Seismic Retrofit Project	Loma Linda University Medical Center	Earthquake	TBD	TBD	Long-term

Figure 6.3



Section 7 Plan Maintenance

7.1 Monitoring, Evaluating and Updating the Plan

The City of Loma Linda will continue to monitor hazards for a better understanding of these hazards and identification of new hazards. As the City monitors these hazards and learns how to mitigate these hazards more efficiently, additional projects may be developed over time.

The inclusion of the LHMP into other existing Loma Linda municipal plans will continue to be a collaborative process that involves multiple stakeholders from associated agencies and departments. Because the LHMP is a living document that reflects ongoing hazard mitigation activities, the process of monitoring, evaluating, and updating will be critical to the effectiveness of hazard mitigation within the City. To facilitate the hazard mitigation planning process, the LHMP will be reviewed annually and revisions will be provided to FEMA in a 5-year cycle, as required.

Departments who are managing mitigation projects will track the status of the projects through the entire life cycle from concept to completion. Each year proposed projects are reviewed during budget development and selected projects are submitted for funding to the appropriate funding source. These funding sources include, General Fund, grant funds, and private funds.

On an annual basis, the Emergency Services Coordinator (ESC) and the Planning Team will review the plan annually and update project status and other sections as necessary. The ESC will also update the LHMP every five (5) years and submit the Plan to Cal EMA and FEMA.

7.2 Implementation Through Existing Programs

The 2005 Hazard Mitigation Plan update includes updated information from the City of Loma Linda 2009 General Plan, Public Health and Safety Element. City ordinances were followed to ensure proper fuels reduction was completed in Hazardous Fire Areas.

The LHMP goals and actions will be incorporated into various general operations of government. For example, some information from the LHMP will be included in the City of Loma Linda Emergency Operations Plan (EOP) that is expected to be updated in 2011. As future plans are developed, the LHMP will be an asset in any plan development efforts. As noted earlier, much of the information contained in this LHMP is from the City's 2009 General Plan and is already part of the planning process.

7.3 Continued Public Involvement

By interacting with various City departments, agencies, community based organizations, private entities, and public forums, the City will have the opportunity to continue to have public involvement in mitigation planning efforts. The City will also inform the public through our website, local television station, and twittering to let them know updates to the plan will be available for their review.



Appendix A

Planning Materials



HMP Planning Team Meeting Agenda

July 1, 2010
10:00 am – 11:00 am



Loma Linda Fire Department, EOC
25541 Barton Road

- I. Welcome/Introductions**
- II. Planning Team Members**
- III. Hazard Mitigation Planning Process**
- IV. Hazard Mitigation Plan Next Steps**
- V. Next Meeting**
 - a. August 24, 2010**



Loma Linda

DRAFT Hazard Mitigation Planning Process

Local Hazard Mitigation Plans (LHMP) are required to be updated every 5 years. The City of Loma Linda's current plan was submitted April 2005 as part of the County's Multi-Jurisdictional Hazard Mitigation Plan and is due to be updated in 2010.

All 24 cities/towns and approximately 30 special districts throughout the County of San Bernardino are participating in the 2010 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). The County hired a consultant to assist all stakeholders (participants) in the development of the plan. The Consultant will be conducting monthly meetings with stakeholders to ensure forward progress of MJHMP.

2010 Multi-Jurisdictional Timeline:

July 1	HMP Portal Rollout
July 15	Stakeholder Conference Call
Aug. 19	Stakeholder Conference Call
Sept. 16	Stakeholder Conference Call
Sept. 20	Submit LHMP to consultant for review
Sept. 20 – Oct. 10	Consultant reviews all 54 plans
Oct. 11	LHMP is submitted to SB County OES for review and "roll-up"
Oct. 11 – Oct. 17	SB County reviews/rolls up all 54 plans
Oct. 18	MJHMP is submitted to Cal EMA/FEMA for review
Dec. 13	FEMA approved by this date
Jan. 10, 2011	Local approval/adoption by this date

Internal Timeline:

July 1	Kick-Off Meeting (planning team members)
August 12	LHMP initial updates complete
Aug 16 – 26	Internal review
Aug 26	LHMP Planning Team Meeting
Aug 31	Updates complete from internal review
Sept. 1	Public Meeting – Planning Commission Meeting
Sept. 14	Public Meeting – City Council Meeting
Sept. 16	Submit LHMP to consultant for review
Dec. 14	City Council – HMP Approval/Adoption (tentative 1/4/2011)

Planning Team:

Jeff Bender	Fire Department
James Gray	Fire Department
Debra Kreske	Fire Department
Jarb Thaipejr	City Manager/Public Works
Jeff Peterson	Public Works
Deborah Woldruff	Community Development
Konrad Bolowich	IT Manger
Diana DeAnda	Finance
Pamela Byrnes-O'Camb	Risk Manager



City of Loma Linda Hazard Mitigation Plan Next Steps July 2010

Next Steps:


- Update population data
- Update critical facilities
- Status of mitigation projects listed in 2005
- Identify new mitigation projects for 2010
- Identify hazard events since April 2005

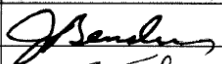
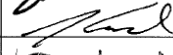
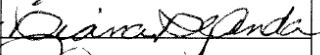
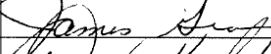
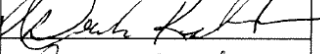
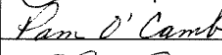

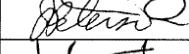
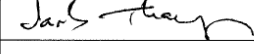
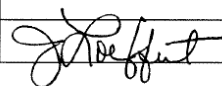


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 **City of Loma Linda**
Hazard Mitigation Plan Planning Meeting Sign-In
July 1, 2010

Name	Title	Signature
Jeff Bender	FIRE CHIEF	
Konrad Bolowich	IS Director	
Diana DeAnda	Finance Director	
Jamie Gray	FIRE Marshal	
Debra Kreske	Emergency Services Coordinator	
Pam O'Camp	City Clerk	
Allan Penaflores	Assistant Planner	
Jeff Peterson	Associate Engineer	
Jarb Thaipetr	City Manager	
Deborah Woldruff	Vacation	
Julia Loeffert	Executive Aide	

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HMP Planning Team Meeting Agenda

August 24, 2010
10:00 am – 11:00 am



Loma Linda Fire Department, EOC
25541 Barton Road

- I. Welcome/Introductions
- II. Planning Team Members
- III. LHMP Timeline Update
- IV. LHMP Status
- V. Next Meeting
 - a. August 26, 2010 Meeting Cancelled
 - b. Sept. 13, 2010, 10:00 am – 11:00 am



.Loma Linda

Hazard Mitigation Planning Process

Local Hazard Mitigation Plans (HMP) are required to be updated every 5 years. The City of Loma Linda's current plan was submitted April 2005 as part of the County's Multi-Jurisdictional Hazard Mitigation Plan and is due to be updated in 2010.

All 24 cities/towns and approximately 30 special districts throughout the County of San Bernardino are participating in the 2010 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). The County hired a consultant to assist all stakeholders (participants) in the development of the plan. The Consultant will be conducting monthly meetings with stakeholders to ensure forward progress of MJHMP.

Updated Internal Timeline:

July 1		Kick-Off Meeting
Aug. 24		HMP Planning Team Meeting
Sept. 9	(Aug. 12)	Initial updates complete
Sept. 13		HMP Planning Team Meeting (Plan Distribution)
Sept. 13 – 23	(Aug. 16 – 26)	HMP Planning Team Plan review
Sept. 23	(Aug. 26)	HMP Planning Team Meeting (Document Review)
Sept. 30	(Aug. 31)	Updates complete from internal review
Oct. 6	(Sept. 1)	Public Meeting – Planning Commission Meeting
Oct. 12	(Sept. 14)	Public Meeting – City Council Meeting
Oct. 22	(Sept. 16)	Submit Loma Linda's HMP to consultant for review
Dec. 14		City Council – HMP Approval/Adoption (tentative 1/4/2011)

Loma Linda LHMP Planning Team:

Name	Title
Jeff Bender	Fire Chief
Konrad Bolowich	IS Director
Diana DeAnda	Finance Director
James Gray	Fire Marshal
George Johnston	LLU Assistant Vice President
Debra Kreske	Emergency Services Coordinator
Julia Loeffert	Executive Aide
Pamela Byrnes-O'Camb	City Clerk
Jim O'Neill	Bryn Mawr E.S. Principal
Allan Penaflorida	Assistant Planner
Jason Peterson	LLUAHSC Emergency Management Specialist
Jeff Peterson	Associate Engineer
Jarb Thaipejr	City Manager
Deborah Woldruff	Community Dev. Director



2010 HMP Next Steps Follow-up

Update Population Data

- Newest Census data from Henry.
- **ACTION:** Julie will you please ask Henry if he has the 2010 Census LL population?

Update Critical Facilities

- 2005 HMP critical facilities were; LLUMC, VA Med Ctr, City Hall, and Fire Station 1
- I'll add Fire Station 2.
- **ACTION:** All, is there any additional critical facilities we want to add? (Whatever we add we'll have to include in the "risk analysis".)

Status of 2005 HMP Mitigation Projects

- Projects listed in HMP:
 - o Reach 2(San Tim. Creek)
 - o Reach 3B(San Tim Creek)
 - o UWI-1(Urban Wildland Interface Fire)
 - o LLUMC (Seismic Retrofit)
- **ACTION:** Public Works and Fire Department identify status of above mitigation projects.

Identify New Mitigation Projects for 2010

- **ACTION:** Public Works, Fire Department, Medical Centers need to start identifying mitigation projects that happened after April 2005, identify current projects, and future known projects.
- It will take awhile to get the details of these projects, but we will need to know the following information regarding each of the projects:

o Name	o Longitude
o Description	o Latitude
o Alternatives	o Hazards Mitigated
o Strategy	o Total Cost
o Status	o Calculated BC Ratio
o Completion Date	o Custom BC Ratio
o Local Priority	o Funding Description

Identify Hazard Events Since April 2005


- 2005 HMP events were described for the top 3 hazards; Earthquake, Flood, Fire.
 - Looking at the events listed in 2005 HMP will help identify the degree of events that need to be listed in the 2010 HMP. The 2005 HMP events listed were:
 - o Earthquakes
 1. Landers Earthquake 6/28/1992
 2. San Jacinto 4/9/1968
 3. San Andreas Fault (last rupture in So. Cal. 1/9/1857)
 - o Flooding
 1. Flood of 1969 1/18/1969
 2. Flood of 1916 1/1/1916
 3. Flood of 1862 1/22/1862
 4. Flood of 1938
 - o Fire
 1. "South Hills" 2001 – one wildfire
 2. "South Hills" 1999 – two wildfires
 3. "South Hills" 1998 – seven wildfires
 - **ACTION:** All, start identifying hazards that have happened to Loma Linda since April 2005.
-

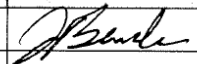
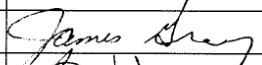

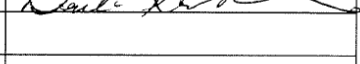
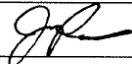
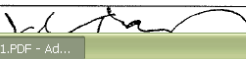


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 **City of Loma Linda**
Hazard Mitigation Plan Planning Meeting Sign-In
August 24, 2010

Name	Title	Signature
Jeff Bender	Fire Chief	
Konrad Bolowich	IS Director	
Diana DeAnda	Finance Director	
Jamie Gray	Fire Marshal	
George Johnston	LLU Assistant Vice President	
Debra Kreske	Emergency Services Coordinator	
Julia Loeffert	Executive Aide	
Pam O'Camp	City Clerk	
Jim O'Neill	Bryn Mawr E.S. Principal	
Allan Penaflorida	Assistant Planner	
Jason Peterson	LLUAHSC Emergency Management Specialist	
Jeff Peterson	Associate Engineer	
Jarb Thaibeir	City Manager	

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HMP Planning Team Meeting Agenda

September 13, 2010
10:00 am – 11:00 am



Loma Linda Fire Department, EOC
25541 Barton Road

- I. Welcome**
- II. LHMP Timeline Update**
- III. LHMP Distribution**
- IV. LHMP Review Period**
 - a. Sept. 13 – 29**
- V. Next Meeting**
 - a. September 29, 10:00 am – 11:00 am**



City of Loma Linda Hazard Mitigation Planning Process

Updated Internal Timeline:

July 1	Kick-Off Meeting
Aug. 24	HMP Planning Team Meeting
Sept. 9	Initial updates complete
Sept. 13, 10:00am	HMP Planning Team Meeting (Plan Distribution)
Sept. 13 – 29	HMP Planning Team Plan review
Sept. 29, 10:00am	HMP Planning Team Meeting (Document Review)
Oct. 4	Updates complete from internal review
Oct. 6	Public Meeting – Planning Commission Meeting
Oct. 12	Public Meeting – City Council Meeting
Oct. 20	Public Meeting – CERT Meeting
Oct. 22	Submit Loma Linda's HMP to consultant for review
Dec. 14	City Council – HMP Approval/Adoption (tentative 1/4/2011)

Loma Linda LHMP Planning Team:


Name	Title
Jeff Bender	Fire Chief
Konrad Bolowich	IS Director
Diana DeAnda	Finance Director
James Gray	Fire Marshal
George Johnston	LLU Assistant Vice President
Debra Kreske	Emergency Services Coordinator
Julia Loeffert	Executive Aide
Pamela Byrnes-O'Camb	City Clerk
Jim O'Neill	Bryn Mawr E.S. Principal
Allan Penaflorida	Assistant Planner
Jason Peterson	LLUAHSC Emergency Management Specialist
Jeff Peterson	Associate Engineer
Jarb Thaipejr	City Manager
Deborah Woldruff	Community Dev. Director


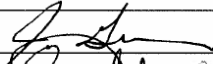


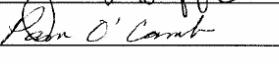

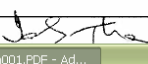


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 **City of Loma Linda
Hazard Mitigation Plan Planning Meeting Sign-In
September 13, 2010**

Name	Title	Signature
Jeff Bender	Fire Chief	
Konrad Bolowich	IS Director	
Diana DeAnda	Finance Director	
Jamie Gray	Fire Marshal	
George Johnston	LLU Assistant Vice President	
Debra Kreske	Emergency Services Coordinator	
Julia Loeffert	Executive Aide	
Pam O'Camp	City Clerk	
Jim O'Neill	Bryn Mawr E.S. Principal	
Allan Penaflorida	Assistant Planner	
Jason Peterson	LLUAHSC Emergency Management Specialist	
Jeff Peterson	Associate Engineer	
Jarb Thaireir	City Manager	

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HMP Planning Team Meeting Agenda

October 18, 2010
10:00 am



Loma Linda Fire Department, EOC
25541 Barton Road

- I. Welcome**
- II. LHMP Timeline Update**
- III. LHMP Distribution**
- IV. LHMP Review Period**
 - a. October 18 - 28**
- V. Next Meeting**
 - a. October 28, 10:00 am**



City of Loma Linda Hazard Mitigation Planning Process October 18, 2010

Internal Timeline:

Oct. 18, 10:00am	HMP Planning Team Meeting (Plan Distribution)
Oct. 18 – 28	HMP Planning Team Plan review
Oct. 28, 10:00am Discussion)	HMP Planning Team Meeting (Document Review
Nov. 1	Updates complete from internal review
Nov. 3	Public Meeting – Planning Commission Meeting
Nov. 9	Public Meeting – City Council Meeting
Nov. 9	Public Outreach – CERT Distribution
Nov. 9	Public Outreach – RACES Distribution
Dec. 2	Submit Loma Linda's HMP to consultant for review
2011	City Council – HMP Approval/Adoption

Loma Linda LHMP Planning Team:

Name	Title
Jeff Bender	Fire Chief
Konrad Bolowich	IS Director
Diana DeAnda	Finance Director
James Gray	Fire Marshal
George Johnston	LLU Assistant Vice President
Debra Kreske	Emergency Services Coordinator
Julia Loeffert	Executive Aide
Pamela Byrnes-O'Camb	City Clerk
Jim O'Neill	Bryn Mawr E.S. Principal
Allan Penaflorida	Assistant Planner
Jason Peterson	LLUAHSC Emergency Management Specialist
Jeff Peterson	Associate Engineer
Jarb Thaipejr	City Manager
Deborah Woldruff	Community Dev. Director



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 **City of Loma Linda**
Hazard Mitigation Plan Planning Meeting Sign-In
September 18, 2010
October

Name	Title	Signature
Jeff Bender	Fire Chief	
Konrad Bolowich	IS Director	
Diana DeAnda	Finance Director	
Jamie Gray	Fire Marshal	
George Johnston	LLU Assistant Vice President	
Debra Kreske	Emergency Services Coordinator	
Julia Loeffert	Executive Aide	
Pam O'Camp	City Clerk	
Jim O'Neill	Bryn Mawr E.S. Principal	
Allan Penaflorida	Assistant Planner	
Jason Peterson	LLUAHSC Emergency Management Specialist	
Jeff Peterson	Associate Engineer	
Jarb Thajpejr	City Manager	
Deborah Woldruff	Community Dev. Director	

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HMP Planning Team Meeting Agenda

November 8, 2010
3:00pm



Loma Linda Fire Department, EOC
25541 Barton Road

- I. Welcome**
- II. LHMP Timeline Update**
- III. LHMP Updates**
- IV. LHMP Final Update Submittals**
 - a. November 24, 2010**
- V. Next Meeting**
 - a. TBD**



City of Loma Linda Hazard Mitigation Planning Process November 8, 2010

Internal Timeline:

Nov. 8 @ 3:00pm	HMP Planning Team Meeting (Document Review Discussion)
Nov. 9	Public Meeting – City Council Meeting
Nov. 9	Public Outreach – CERT Distribution
Nov. 9	Public Outreach – RACES Distribution
Nov. 17	Public Meeting – Planning Commission Meeting
Nov. 24	Review Comments Due for Final HMP Updates
Dec. 2	Submit Loma Linda's HMP to consultant for review
2011	City Council – HMP Approval/Adoption

Loma Linda LHMP Planning Team:


Name	Title
Jeff Bender	Fire Chief
Konrad Bolowich	IS Director
Gordon Day	Loma Linda Academy Jr. High Principal
Diana DeAnda	Finance Director
Jamie Gray	Fire Marshal
George Johnston	LLU Assistant Vice President
Debra Kreske	Emergency Services Coordinator
Julia Loeffert	Executive Aide
Pam O'Camp	City Clerk
Jim O'Neill	Bryn Mawr E.S. Principal
Allan Penaflorida	Assistant Planner
Jason Peterson	LLUAHSC Emergency Management Specialist
Jeff Peterson	Associate Engineer
Jarb Thaipejr	City Manager
Deborah Woldruff	Community Dev. Director

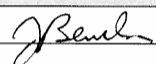

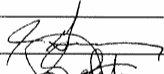
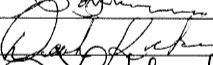
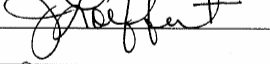
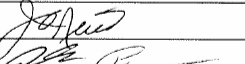
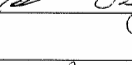
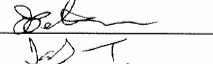
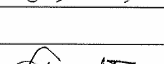
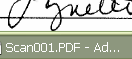



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 **City of Loma Linda
Hazard Mitigation Plan Planning Meeting Sign-In
November 8, 2010**

Name	Title	Signature
Jeff Bender	Fire Chief	
Konrad Bolowich	IS Director	
Gordon Day	LL Academy Jr. High Principal	
Diana DeAnda	Finance Director	
Jamie Gray	Fire Marshal	
George Johnston	LLU Assistant Vice President	
Debra Kreske	Emergency Services Coordinator	
Julia Loeffert	Executive Aide	
Pam O'Camp	City Clerk	
Jim O'Neill	Bryn Mawr E.S. Principal	
Allan Penaflorida	Assistant Planner	
Jason Peterson	LLUAHSC Emergency Management Specialist	
Jeff Peterson	Associate Engineer	
Jarb Thaipejr	City Manager	
Deborah Woldruff	Community Dev. Director	
Lynette Amcola		

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CITY OF LOMA LINDA LOCAL HAZARD MITIGATION PLAN UPDATE

November 9, 2010

Background

- The Hazard Mitigation Plan (HMP) identifies hazards and the mitigation actions to reduce these hazards.
- FEMA emphasizes that HMP should be "performance standard" rather than "prescriptive"; meaning "what" needs to be done rather than "how" it should be done.
- The HMP is required for federal assistance programs:
 - Hazard Mitigation Grant Program (HMGP)
 - Pre Disaster Mitigation (PDM) program
 - Assembly Bill No. 2140

Background (Con't)

- HMP's are required to be updated every 5 years. Loma Linda's HMP was originally developed in 2005.
- Disaster Mitigation Act of 2000 (DMA2000) encourages participation in Multi-Jurisdictional HMP (MJHMP).
 - In 2005 the City was one of 56 partners in the County of San Bernardino's MJHMP.
 - In 2010 the City is one of 54 partners in the County's MJHMP.

Planning Team Members

- Jeff Bender, Fire Chief
- Konrad Bolowich, IS Director
- Gordon Day, Loma Linda Academy Jr. High Principal
- Diana DeAnda, Finance Director
- Jamie Gray, Fire Marshal
- George Johnston, LLU Assistant Vice President
- Debra Kreske, Emergency Services Coordinator
- Julia Loeffert, Fire Department Executive Aide
- Pam O'Camp, City Clerk
- Jim O'Neill, Bryn Mawr E.S. Principal
- Allan Penafiora, Assistant Planner
- Jason Peterson, LLUAHSC Emergency Management Specialist
- Jeff Peterson, Associate Engineer
- Jarb Thaipr, City Manager
- Deborah Woldruff, Community Dev. Director

Hazard Identification

- 2010 HMP's hazards as identified in the City's 2009 General Plan
 1. Earthquake
 2. Wildfires
 3. Flooding
 4. Hazardous Waste
 5. Slope Failure
 6. Airplane Crash
 7. Railroad Accidents
 8. Terrorism

Hazard Assessment Matrix

		Impact		
		High	Medium	Low
Probability	High	Earthquake	Wildfires	
	Medium	Flooding	Hazardous Waste and Materials	Slope Failure Airplane Crash Railroad Accidents
	Low	Terrorism		



Hazard Mitigation Projects

- Earthquakes
 - Anderson Bridge Seismic Retrofit (Proposed)
 - Loma Linda University Medical Center Seismic Retrofit Project
- Wildfires
 - Urban-Wildland Interface Hillside Weed Abatement Program
- Floods
 - Zanja Channel Improvement (Proposed)



Timeline

- City of Loma Linda's Timeline
 - Nov. 9; City Council Presentation, CERT & RACES Distribution
 - Nov. 17; Planning Commission Meeting Presentation
 - Nov. 24; All "Review Comments" Due to Fire Department
 - Dec. 2; Submit Loma Linda's HMP to County OES



2010 Mitigation Plan Review

- The City of Loma Linda's Hazard Mitigation Plan is available for Public Review at the Fire Department:

Loma Linda Fire Department
25541 Barton Road
Loma Linda, CA 92354

