Master Resource Directory

The Resource Directory provides contact information for local, regional, state, and federal programs that are currently involved in hazard mitigation activities. The Hazard Mitigation Advisory Committee may look to the organizations on the following pages for resources and technical assistance. The Resource Directory provides a foundation for potential partners in action item implementation.

The Hazard Mitigation Advisory Committee will continue to add contact information for organizations currently engaged in hazard mitigation activities. This section may also be used by various community members interested in hazard mitigation information and projects.

American Public Works Association			
Level: National	Hazard: Multi	http://www.apwa.net	
2345 Grand Boulevard		Suite 500	
Kansas City, MO 64108-2641		Ph: 816-472-6100	Fx: 816-472-1610
Notes: The American Public Works Association is an international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.			
Association of State Floodplain Managers			
Level: Federal	Hazard: Flood	www.floods.org	
2809 Fish Hatchery Road			
Madison, WI 53713		Ph: 608-274-0123	Fx:
Notes: The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery			
Building Seismic Safety Council (BSSC)			
Level: National	Hazard: Earthquake	www.bssconline.org	
1090 Vermont Ave., NW		Suite 700	
Washington, DC 20005		Ph: 202-289-7800	Fx: 202-289-109
Notes: The Building Seismic Safety Council (BSSC) develops and promotes building earthquake risk mitigation regulatory provisions for the nation.			

California Department of Transportation (CalTrans)			
Level: State	Hazard: Multi	http://www.dot.ca.gov/	
120 S. Spring Street			
Los Angeles, CA 90012		Ph: 213-897-3656	Fx:
Notes: CalTrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries. Alone and in partnership with Amtrak, Caltrans is also involved in the support of intercity passenger rail service in California.			

California Resources Agency			
Level: State	Hazard: Multi	http://resources.ca.gov/	
1416 Ninth Street		Suite 1311	
Sacramento, CA 95814		Ph: 916-653-5656	Fx:
Notes: The California Resources Agency restores, protects and manages the state's natural, historical and cultural resources for current and future generations using solutions based on science, collaboration and respect for all the communities and interests involved.			

California Division of Forestry (CDF)			
Level: State	Hazard: Multi	http://www.fire.ca.gov/php/index.php	
210 W. San Jacinto			
Perris CA 92570		Ph: 909-940-6900	Fx:
Notes: The California Department of Forestry and Fire Protection protects over 31 million acres of California's privately-owned wildlands. CDF emphasizes the management and protection of California's natural resources.			

California Division of Mines and Geology (DMG)			
Level: State	Hazard: Multi	www.consrv.ca.gov/cgs/index.htm	
801 K Street		MS 12-30	
Sacramento, CA 95814		Ph: 916-445-1825	Fx: 916-445-5718
Notes: The California Geological Survey develops and disseminates technical information and advice on California's geology, geologic hazards, and mineral resources.			

California Environmental Resources Evaluation System (CERES)			
Level: State	Hazard: Multi	http://ceres.ca.gov/	
900 N St.		Suite 250	
Sacramento, Ca. 95814		Ph: 916-653-2238	Fx:
Notes: CERES is an excellent website for access to environmental information and websites.			

California Department of Water Resources (DWR)			
Level: State	Hazard: Flood	http://wwwdwr.water.ca.gov	
1416 9th Street			
Sacramento, CA 95814		Ph: 916-653-6192	Fx:
Notes: The Department of Water Resources manages the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.			

California Department of Conservation: Southern California Regional Office			
Level: State	Hazard: Multi	www.consrv.ca.gov	
655 S. Hope Street		#700	
Los Angeles, CA 90017-2321		Ph: 213-239-0878	Fx: 213-239-0984
Notes: The Department of Conservation provides services and information that promote environmental health, economic vitality, informed land-use decisions and sound management of our state's natural resources.			

California Planing Information Network			
Level: State	Hazard: Multi	www.calpin.ca.gov	
		Ph:	Fx:
Notes: The Governor's Office of Planning and Research (OPR) publishes basic information on local planning agencies, known as the California Planners' Book of Lists. This local planning information is available on-line with new search capabilities and up-to-the- minute updates.			

EPA, Region 9			
Level: Regional	Hazard: Multi	http://www.epa.gov/region09	
75 Hawthorne Street			
San Francisco, CA 94105		Ph: 415-947-8000	Fx: 415-947-3553
Notes: The mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment through the themes of air and global climate change, water, land, communities and ecosystems, and compliance and environmental stewardship.			

Federal Emergency Management Agency, Region IX			
Level: Federal	Hazard: Multi	www.fema.gov	
1111 Broadway		Suite 1200	
Oakland, CA 94607		Ph: 510-627-7100	Fx: 510-627-7112
Notes: The Federal Emergency Management Agency is tasked with responding to, planning for, recovering from and mitigating against disasters.			

Federal Emergency Management Agency, Mitigation Division			
Level: Federal	Hazard: Multi	www.fema.gov/fima/planhowto.shtm	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.			

Floodplain Management Association			
Level: Federal	Hazard: Flood	www.floodplain.org	
P.O. Box 50891			
Sparks, NV 89435-0891		Ph: 775-626-6389	Fx: 775-626-6389
Notes: The Floodplain Management Association is a nonprofit educational association. It was established in 1990 to promote the reduction of flood losses and to encourage the protection and enhancement of natural floodplain values. Members include representatives of federal, state and local government agencies as well as private firms.			

Gateway Cities Partnership			
Level: Regional	Hazard: Multi	www.gatewaycities.org	
7300 Alondra Boulevard		Suite 202	
Paramount, CA 90723		Ph: 562-817-0820	Fx:
Notes: Gateway Cities Partnership is a 501 C 3 non-profit Community Development Corporation for the Gateway Cities region of southeast LA County. The region comprises 27 cities that roughly speaking extends from Montebello on the north to Long Beach on the South, the Alameda Corridor on the west to the Orange County line on the east.			

Governor's Office of Emergency Services (OES)			
Level: State	Hazard: Multi	www.oes.ca.gov	
P.O. Box 419047			
Rancho Cordova, CA 95741-9047		Ph: 916 845- 8911	Fx: 916 845-8910
Notes: The Governor's Office of Emergency Services coordinates overall state agency response to major disasters in support of local government. The office is responsible for assuring the state's readiness to respond to and recover from natural, manmade, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts.			

Greater Antelope Valley Economic Alliance			
Level: Regional	Hazard: Multi		
42060 N. Tenth Street West			
Lancaster, CA 93534		Ph: 661-945-2741	Fx: 661-945-7711
Notes: The Greater Antelope Valley Economic Alliance, (GA VEA) is a 501 (c)(6) nonprofit organization with a 501(c)(3) affiliated organization the Antelope Valley Economic Research and Education Foundation. GA VEA is a public-private partnership of business, local governments, education, non-profit organizations and health care organizations that was founded in 1999 with the goal of attracting good paying jobs to the Antelope Valley in order to build a sustainable economy.			

Landslide Hazards Program, USGS			
Level: Federal	Hazard: Landslide	http://landslides.usgs.gov/index.html	
12201 Sunrise Valley Drive		MS 906	
Reston, VA 20192		Ph: 703-648- 4000	Fx:
Notes: The NLIC website provides good information on the programs and resources regarding landslides. The page includes information on the National Landslide Hazards Program Information Center, a bibliography, publications, and current projects. USGS scientists are working to reduce long-term losses and casualties from landslide hazards through better understanding of the causes and mechanisms of ground failure both nationally and worldwide.			

Los Angeles County Economic Development Corporation			
Level: Regional	Hazard: Multi	www.laedc.org	
444 S. Flower Street		34th Floor	
Los Angeles, CA 90071		Ph: 213-236-4813	Fx: 213- 623-0281
Notes: The LAEDC is a private, non-profit 501 (c) 3 organization established in 1981 with the mission to attract, retain and grow businesses and jobs in the Los Angeles region. The LAEDC is widely relied upon for its Southern California Economic Forecasts and Industry Trend Reports. Lead by the renowned Jack Kyser (Sr. Vice President, Chief Economist) his team of researchers produces numerous publications to help business, media and government navigate the LA region's diverse economy.			

Los Angeles County Public Works Department			
Level: County	Hazard: Multi	http://ladpw.org	
900 S. Fremont Ave.			
Alhambra, CA 91803		Ph: 626-458-5100	Fx:
Notes: The Los Angeles County Department of Public Works protects property and promotes public safety through Flood Control, Water Conservation, Road Maintenance, Bridges, Buses and Bicycle Trails, Building and Safety, Land Development, Waterworks, Sewers, Engineering, Capital Projects and Airports			

National Wildland/Urban Interface Fire Program			
Level: Federal	Hazard: Wildfire	www.firewise.org/	
1 Batterymarch Park			
Quincy, MA 02169-7471		Ph: 617-770-3000	Fx: 617 770-0700
Notes: Firewise maintains a Website designed for people who live in wildfire- prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.			

National Resources Conservation Service			
Level: Federal	Hazard: Multi	http://www.nrcs.usda.gov/	
14th and Independence Ave., SW		Room 5105-A	
Washington, DC 20250		Ph: 202-720-7246	Fx: 202-720-7690
Notes: NRCS assists owners of America's private land with conserving their soil, water, and other natural resources, by delivering technical assistance based on sound science and suited to a customer's specific needs. Cost shares and financial incentives are available in some cases.			

National Interagency Fire Center (NIFC)			
Level: Federal	Hazard: Wildfire	www.nifc.gov	
3833 S. Development Ave.			
Boise, Idaho 83705-5354		Ph: 208-387- 5512	Fx:
Notes: The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations.			

National Fire Protection Association (NFPA)			
Level: National	Hazard: Wildfire	http://www.nfpa.org/catalog/home/index.asp	
1 Batterymarch Park			
Quincy, MA 02169-7471		Ph: 617-770-3000	Fx: 617 770-0700
Notes: The mission of the international nonprofit NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically-based consensus codes and standards, research, training and education			

National Floodplain Insurance Program (NFIP)			
Level: Federal	Hazard: Flood	www.fema.gov/nfip/	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.			

National Oceanic /Atmospheric Administration			
Level: Federal	Hazard: Multi	www.noaa.gov	
14th Street & Constitution Ave NW		Rm 6013	
Washington, DC 20230		Ph: 202-482-6090	Fx: 202-482-3154
Notes: NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.			

National Weather Service, Office of Hydrologic Development			
Level: Federal	Hazard: Flood	http://www.nws.noaa.gov/	
1325 East West Highway		SSMC2	
Silver Spring, MD 20910		Ph: 301-713-1658	Fx: 301-713-0963
Notes: The Office of Hydrologic Development (OHD) enhances National Weather Service products by: infusing new hydrologic science, developing hydrologic techniques for operational use, managing hydrologic development by NWS field office, providing advanced hydrologic products to meet needs identified by NWS customers			

National Weather Service			
Level: Federal	Hazard: Multi	http://www.nws.noaa.gov/	
520 North Elevar Street			
Oxnard, CA 93030		Ph: 805-988- 6615	Fx:
Notes: The National Weather Service is responsible for providing weather service to the nation. It is charged with the responsibility of observing and reporting the weather and with issuing forecasts and warnings of weather and floods in the interest of national safety and economy. Briefly, the priorities for service to the nation are: 1. protection of life, 2. protection of property, and 3. promotion of the nation's welfare and economy.			

San Gabriel Valley Economic Partnership			
Level: Regional	Hazard: Multi	www.valleynet.org	
4900 Rivergrade Road		Suite A310	
Irwindale, CA 91706		Ph: 626-856-3400	Fx: 626-856-5115
Notes: The San Gabriel Valley Economic Partnership is a non-profit corporation representing both public and private sectors. The Partnership is the exclusive source for San Gabriel Valley-specific information, expertise, consulting, products, services, and events. It is the single organization in the Valley with the mission to sustain and build the regional economy for the mutual benefit of all thirty cities, chambers of commerce, academic institutions, businesses and residents.			

Sanitation Districts of Los Angeles County			
Level: County	Hazard: Flood	http://www.lacsd.ora/	
1955 Workman Mill Road			
Whittier, CA 90607		Ph:562-699-7411 x2301	Fx:
Notes: The Sanitation Districts provide wastewater and solid waste management for over half the population of Los Angeles County and turn waste products into resources such as reclaimed water, energy, and recyclable materials.			

Santa Monica Mountains Conservancy			
Level: Regional	Hazard: Multi	http://smmc.ca.gov/	
570 West Avenue Twenty-Six		Suite 100	
Los Angeles, CA 90065		Ph: 323-221-8900	Fx:
Notes: The Santa Monica Mountains Conservancy helps to preserve over 55,000 acres of parkland in both wilderness and urban settings, and has improved more than 114 public recreational facilities throughout Southern California.			

South Bay Economic Development Partnership			
Level: Regional	Hazard: Multi	www.southbaypartnership.com	
3858 Carson Street		Suite 110	
Torrance, CA 90503		Ph: 310-792-0323	Fx: 310-543-9886
Notes: The South Bay Economic Development Partnership is a collaboration of business, labor, education and government. Its primary goal is to plan an implement an economic development and marketing strategy designed to retain and create jobs and stimulate economic growth in the South Bay of Los Angeles County.			

South Coast Air Quality Management District (AQMD)			
Level: Regional	Hazard: Multi	www.aqmd.gov	
21865 E. Copley Drive			
Diamond Bar, CA 91765		Ph: 800-CUT-SMOG	Fx:
Notes: AQMD is a regional government agency that seeks to achieve and maintain healthful air quality through a comprehensive program of research, regulations, enforcement, and communication. The AQMD covers Los Angeles and Orange Counties and parts of Riverside and San Bernardino Counties.			

Southern California Earthquake Center (SCEC)			
Level: Regional	Hazard: Earthquake	www.scec.org	
3651 Trousdale Parkway		Suite 169	
Los Angeles, CA 90089-0742		Ph: 213-740-5843	Fx: 213/740-0011
Notes: The Southern California Earthquake Center (SCEC) gathers new information about earthquakes in Southern California, integrates this information into a comprehensive and predictive understanding of earthquake phenomena, and communicates this understanding to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives.			

Southern California Association of Governments (SCAG)			
Level: Regional	Hazard: Multi	www.scag.ca.gov	
818 W. Seventh Street		12th Floor	
Los Angeles, CA 90017		Ph: 213-236-1800	Fx: 213-236-1825
Notes: The Southern California Association of Governments functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.			

State Fire Marshal (SFM)			
Level: State	Hazard: Wildfire	http://osfm.fire.ca.gov	
1131 "S" Street			
Sacramento, CA 95814		Ph: 916-445-8200	Fx: 916-445-8509
Notes: The Office of the State Fire Marshal (SFM) supports the mission of the California Department of Forestry and Fire Protection (CDF) by focusing on fire prevention. SFM regulates buildings in which people live, controls substances which may, cause injuries, death and destruction by fire; provides statewide direction for fire prevention within wildland areas; regulates hazardous liquid pipelines; reviews regulations and building standards; and trains and educates in fire protection methods and responsibilities.			

The Community Rating System (CRS)			
Level: Federal	Hazard: Flood	http://www.fema.gov/nfip/crs.shtm	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimum requirements of the NFIP. Property owners within the County would receive reduced NFIP flood insurance premiums if the County implements floodplain management practices that qualify it for a CRS rating. For further information on the CRS, visit FEMA's website.			

United States Geological Survey			
Level: Federal	Hazard: Multi	http://www.usgs.gov/	
345 Middlefield Road			
Menlo Park, CA 94025		Ph: 650-853-8300	Fx:
Notes: The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.			

US Army Corps of Engineers			
Level: Federal	Hazard: Multi	http://www.usace.army.mil	
P.O. Box 532711			
Los Angeles CA 90053- 2325		Ph: 213-452- 3921	Fx:
Notes: The United States Army Corps of Engineers work in engineering and environmental matters. A workforce of biologists, engineers, geologists, hydrologists, natural resource managers and other professionals provide engineering services to the nation including planning, designing, building and operating water resources and other civil works projects.			

USDA Forest Service			
Level: Federal	Hazard: Wildfire	http://www.fs.fed.us	
1400 Independence Ave. SW			
Washington, D.C. 20250-0002		Ph: 202-205-8333	Fx:
Notes: The Forest Service is an agency of the U.S. Department of Agriculture. The Forest Service manages public lands in national forests and grasslands.			
USGS Water Resources			
Level: Federal	Hazard: Multi	www.water.usgs.gov	
6000 J Street		Placer Hall	
Sacramento, CA 95819-6129		Ph: 916-278-3000	Fx: 916-278-3070
Notes: The USGS Water Resources mission is to provide water information that benefits the Nation's citizens: publications, data, maps, and applications software.			
Western States Seismic Policy Council (WSSPC)			
Level: Regional	Hazard: Earthquake	www.wsspc.org/home.html	
125 California Avenue		Suite D201, #1	
Palo Alto, CA 94306		Ph: 650-330-1101	Fx: 650-326-1769
Notes: WSSPC is a regional earthquake consortium funded mainly by FEMA. Its website is a great resource, with information clearly categorized - from policy to engineering to education.			
Westside Economic Collaborative C/O Pacific Western Bank			
Level: Regional	Hazard: Multi	http://www.westside-Ia.or	
120 Wilshire Boulevard			
Santa Monica, CA 90401		Ph: 310-458-1521	Fx: 310-458-6479
Notes: The Westside Economic Development Collaborative is the first Westside regional economic development corporation. The Westside EDC functions as an information gatherer and resource center, as well as a forum, through bringing business, government, and residents together to address issues affecting the region: Economic Diversity, Transportation, Housing, Workforce Training and Retraining, Lifelong Learning, Tourism, and Embracing Diversity.			

The Public Participation Process

Public participation is a key component to strategic planning processes. Citizen participation offers citizens the chance to voice their ideas, interests, and opinions. The Federal Emergency Management Agency also requires public input during the development of mitigation plans.

The City of Monterey Park Local Hazards Mitigation Plan integrates a cross-section of citizen input throughout the planning process. To accomplish this goal, the City of Monterey Park Hazard Mitigation Advisory Committee developed a public participation process through three components: (1) developing a project steering committee comprised of knowledgeable individuals representative of the community; (2) conducting stakeholder interviews to target the specialized knowledge of individuals working with populations or areas at risk from natural hazards; and (3) conducting two public workshops to identify common concerns and ideas regarding hazard mitigation and to discuss specific goals and actions of the mitigation plan.

Integrating public participation during the development of the City of Monterey Park Local Hazards Mitigation Plan has ultimately resulted in increased public awareness. Through citizen involvement, the mitigation plan reflects community issues, concerns, and new ideas and perspectives on mitigation opportunities and plan action items.

Steering Committee:

Hazard Mitigation in the City of Monterey Park is overseen by the Hazard Mitigation Advisory Committee, which consists of representatives from various city departments, representatives from local business and community organizations and the public. Steering committee members have an understanding of how the community is structured and how residents, businesses, and the environment may be affected by natural hazard events. The steering committee guided the development of the plan, and assisted in developing plan goals and action items, identifying stakeholders, and sharing local expertise to create a more comprehensive plan.

The table below lists the various people and organizations that participated on the City of Monterey Park Local Hazard Mitigation Planning Committee.

Hazard Mitigation Planning Committee:

PROJECT STEERING COMMITTEE:
City of Monterey Park – City Manager
City of Monterey Park – City Council
City of Monterey Park Planning and Development
City of Monterey Park Emergency Services Coordinator
City of Monterey Park Fire Department
City of Monterey Park Police Department
City of Monterey Park Finance
City of Monterey Park Planning
City of Monterey Park Community Development
City of Monterey Park Public Affairs
City of Monterey Park Public Works
California Division of Mines and Geology
California Division of Forestry
Federal Emergency Management Agency
Southern California Association of Governments
Governor's Office of Emergency Services

Meeting #1:

March 15, 2008

The purpose of this meeting was to set in motion the process to create the Local Hazard Mitigation Plan for the City of Monterey Park, as required by the Disaster Mitigation Act of 2000.

The function of the city in regards to the plan and public input and process was discussed. The scope of those considered "stakeholders was discussed, and included not only all city departments, but the City council, school Districts, railroad, medical facilities, Chamber of Commerce, public utilities, and other members of the public.

Ways to gather public input, an important part of the process, were suggested, as was use of the City's cable television channel, city newsletter, city's website, and flyers for distribution to citizen groups. The need for citizen meetings was also discussed.

Goal areas and ideas discussed include:

Goal Area	Idea
Property Protection	**Reduce insurance losses and repetitive claims for chronic hazard events while promoting insurance coverage for catastrophic hazards. Focus resources on activities involving property owners and that assist in protecting homes, structures, or property from natural hazards.**
Natural Systems	**Evaluate and make recommendations for city guidelines, codes, and permitting processes in addressing local hazard mitigation and development in vulnerable areas. Link watershed planning, natural resource management, and land use planning with local hazard mitigation activities to protect vital habitat and water quality. Preserve and rehabilitate natural systems to serve local hazard mitigation functions.**
Public Awareness	**Develop and implement education programs that will increase property owners and developers awareness of natural hazards. Develop and conduct outreach programs to increase the number of local, county, and regional activities implemented by public and private sector organizations.**
Partnerships	**Strengthen communication and coordinate participation in and between public agencies, citizens, non-profit organizations, business, and industry. Document the process and resources that will reduce the administrative burden on the requestors/recipients of grant funds. Provoke congressional attention by identifying mitigation priorities.**

Emergency Services	**Establish policy to encourage mitigation for critical facilities, services, and infrastructure. Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.**
Implementation	**Promote leadership within public agencies to implement local hazard mitigation activities. Attain participation and funding to implement mitigation activities by creating a dynamic document, which is continually updated and revised.**
Guide Development and Use of Vulnerable Areas	**Identify a clear process by which planners can identify and illustrate to potential developers the natural hazards that are present, the threat they pose, and how their development will be mitigated, regulated, and possibly limited. Improve hazard identification, assessment and summarize hazards data and possible mitigation strategies to address those hazards in a palatable format**

Public Meetings:

City of Monterey Park coordinated two public workshops in the City to gather public ideas and opinions about the mitigation plan goals and activities.

First Public Workshop: May 1, 2008:

The first public workshop provided information on the mitigation plan to all interested parties and had information available on issues related to natural hazards in the community.

Invitation Process:

The Disaster Preparedness Coordinator worked with the Chairperson to identify all possible public notice sources. A press release was submitted to local print media. Additionally, the chairperson sent letters of invitation to all city homeowner associations. Information was listed on the City website.

Results:

All possible natural hazards were identified and how they would impact the ability of the City to respond effectively. The committee identified numerous natural hazards and ranked them according to threat. Hazards were profiled and critical hazards identified.

Second Public Workshop: May 19,2008

The City of Monterey Park held the second public workshop to gather public input on issues related to natural hazards in the city, as well as ideas for strategies to reduce risk.

Invitation Process:

The City Disaster Preparedness Coordinator worked with the Chairperson to identify all possible public notice sources. A press release was submitted to local print media. Additionally, the chairperson sent letters of invitation to all city homeowner associations. Information was listed on the City website.

Results:

Information on the Local Hazards Mitigation Plan was provided.

Economic Analysis of Local Hazard Mitigation Projects

Benefit/cost analysis is a key mechanism used by the state Office of Emergency Services (OES), the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

This appendix outlines several approaches for conducting economic analysis of natural and manmade hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, State Hazard Mitigation Plan, (Oregon State Police – Office of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, Report on Costs and Benefits of Hazard Mitigation.

This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to provide the details of economic analysis methods that can be used to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred.

Evaluating natural and manmade hazard mitigation provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural and manmade disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools.

Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce "ripple-effects" throughout the community, greatly increasing the disaster's social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

What are Some Economic Analysis Approaches for Mitigation Strategies?

The approaches used to identify the costs and benefits associated with local hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. The distinction between the two methods is the way in which the relative costs and benefits are measured. Additionally, there are varying approaches to assessing the value of mitigation for public sector and private sector activities.

Benefit/Cost Analysis:

Benefit/cost analysis is used in hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk.

In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented (i.e., if net benefits exceed net costs, the project is worth pursuing). A project must have a benefit/cost ratio greater than 1 in order to be funded.

Cost-Effectiveness Analysis:

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural and manmade hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

> **Investing in public sector mitigation activities:**
> Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of public decisions that involve a diverse set of beneficiaries and nonmarket benefits.

Investing in private sector mitigation activities:
Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

How Can an Economic Analysis be Conducted?

Benefit/cost analysis and cost-effectiveness analysis are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating alternative mitigation activities is outlined below:

Identify the Alternatives:

Alternatives for reducing risk from natural and manmade hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project can assist in minimizing risk to natural and manmade hazards, but do so at varying economic costs.

Calculate the Costs and Benefits:

Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate alternative. Potential economic criteria to evaluate alternatives include:

- ✓ **Determine the project cost.** This may include initial project development costs, and repair and operating costs of maintaining projects over time.

- ✓ **Estimate the benefits.** Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known.

    Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project.

    These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.

Consider Costs and Benefits to Society and the Environment:

These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.

- ✓ **Determine the correct discount rate.**
  Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

Analyze and Rank the Alternatives:

Once costs and benefits have been quantified, economic analysis tools can rank the alternatives. Two methods for determining the best alternative given varying costs and benefits include net present value and internal rate of return.

- ✓ **Net present value.** Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.

- ✓ **Internal Rate of Return.** Using the internal rate of return method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project.

Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk; project effectiveness; and economic, environmental, and social returns in choosing the appropriate project for implementation.

How are Benefits of Mitigation Calculated?

Economic Returns of Local Hazard Mitigation;

The estimation of economic returns, which accrue to building or land owner as a result of natural and manmade hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- ✓ Building damages avoided
- ✓ Content damages avoided
- ✓ Inventory damages avoided
- ✓ Rental income losses avoided
- ✓ Relocation and disruption expenses avoided
- ✓ Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner.

The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

Additional Costs from Natural and Manmade Hazards:

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural or manmade disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- ✓ Commodity and resource prices
- ✓ Availability of resource supplies
- ✓ Commodity and resource demand changes
- ✓ Building and land values
- ✓ Capital availability and interest rates
- ✓ Availability of labor
- ✓ Economic structure

- ✓ Infrastructure
- ✓ Regional exports and imports
- ✓ Local, state, and national regulations and policies
- ✓ Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy.

Decision makers should understand the total economic impacts of natural and manmade disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural and manmade hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for local hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate local hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating hazard mitigation with other community projects can increase the viability of project implementation.

Resources

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Federal Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ATC	Applied Technology Council
B/CA	Benefit/Cost Analysis
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BSSC	Building Seismic Safety Council
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CRS	Community Rating System
EDA	Economic Development Administration
EPA	Environmental Protection Agency
ER	Emergency Relief
EWP	Emergency Watershed Protection (NRCS Program)
FAS	Federal Aid System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance (FEMA Program)
FTE	Full Time Equivalent
GIS	Geographic Information System
GNS	Institute of Geological and Nuclear Sciences (International)
GSA	General Services Administration
HAZUS	Hazards U.S.
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team
HUD	Housing and Urban Development (United States, Department of)
IBHS	Institute for Business and Home Safety
ICC	Increased Cost of Compliance
IHMT	Interagency Hazard Mitigation Team
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
LHMP	Local Hazard Mitigation Plan (also known as "409 Plan")
NIBS	National Institute of Building Sciences
NIFC	National Interagency Fire Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
SBA	Small Business Administration
SEAO	Structural Engineers Association of Oregon
SHMO	State Hazard Mitigation Officer
TOR	Transfer of Development Rights
UGB	Urban Growth Boundary
URM	Unreinforced Masonry

USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
USGS	United States Geological Survey
WSSPC	Western States Seismic Policy Council

California Acronyms

A&W	Alert and Warning
AA	Administering Areas
AAR	After Action Report
ARC	American Red Cross
ARP	Accidental Risk Prevention
ATC20	Applied Technology Council20
ATC21	Applied Technology Council21
BCP	Budget Change Proposal
BSA	California Bureau of State Audits
CAER	Community Awareness & Emergency Response
CalARP	California Accidental Release Prevention
CalBO	California Building Officials
CalEPA	California Environmental Protection Agency
CalREP	California Radiological Emergency Plan
CALSTARS	California State Accounting Reporting System
CalTRANS	California Department of Transportation
CBO	Community Based Organization
CD	Civil Defense
CDF	California Department of Forestry and Fire Protection
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEPEC	California Earthquake Prediction Evaluation Council
CESRS	California Emergency Services Radio System
CHIP	California Hazardous Identification Program
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CLETS	California Law Enforcement Telecommunications System
CSTI	California Specialized Training Institute
CUEA	California Utilities Emergency Association
CUPA	Certified Unified Program Agency
DAD	Disaster Assistance Division (of the state Office of Emergency Svcs)
DFO	Disaster Field Office
DGS	California Department of General Services
DHSRHB	California Department of Health Services, Radiological Health Branch
DO	Duty Officer
DOC	Department Operations Center
DOE	Department of Energy (U.S.)
DOF	California Department of Finance
DOJ	California Department of Justice
DPA	California Department of Personnel Administration
DPIG	Disaster Preparedness Improvement Grant
DR	Disaster Response
DSA	Division of the State Architect
DSR	Damage Survey Report
DSW	Disaster Service Worker

DWR	California Department of Water Resources
EAS	Emergency Alerting System
EDIS	Emergency Digital Information System
EERI	Earthquake Engineering Research Institute
EMA	Emergency Management Assistance
EMI	Emergency Management Institute
EMMA	Emergency Managers Mutual Aid
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency (U.S.)
EPEDAT	Early Post Earthquake Damage Assessment Tool
EPI	Emergency Public Information
EPIC	Emergency Public Information Council
ESC	Emergency Services Coordinator
FAY	Federal Award Year
FDAA	Federal Disaster Assistance Administration
FEAT	Governor's Flood Emergency Action Team
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FIR	Final Inspection Reports
FIRESCOPE	Firefighting Resources of So. Calif Organized for Potential Emergencies
FMA	Flood Management Assistance
FSR	Feasibility Study Report
FY	Fiscal Year
GIS	Geographical Information System
HAZMAT	Hazardous Materials
HAZMIT	Hazardous Mitigation
HAZUS	Hazards United States (an earthquake damage assessment prediction tool)
HAD	Housing and Community Development
HEICS	Hospital Emergency Incident Command System
HEPG	Hospital Emergency Planning Guidance
HIA	Hazard Identification and Analysis Unit
HMEP	Hazardous Materials Emergency Preparedness
HMGP	Hazard Mitigation Grant Program
IDE	Initial Damage Estimate
IA	Individual Assistance
IFG	Individual & Family Grant (program)
IRG	Incident Response Geographic Information System
IPA	Information and Public Affairs (of state Office of Emergency Services)
LAN	Local Area Network
LEMMA	Law Enforcement Master Mutual Aid
LEPC	Local Emergency Planning Committee
MARAC	Mutual Aid Regional Advisory Council
MHID	Multihazard Identification
MOU	Memorandum of Understanding
NBC	Nuclear, Biological, Chemical

NEMA	National Emergency Management Agency
NEMIS	National Emergency Management Information System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Association
NPP	Nuclear Power Plant
NSF	National Science Foundation
NWS	National Weather Service
OA	Operational Area
OASIS	Operational Area Satellite Information System
OCC	Operations Coordination Center
OCD	Office of Civil Defense
OEP	Office of Emergency Planning
OES	California Governor's Office of Emergency Services
OSHPD	Office of Statewide Health Planning and Development
OSPR	Oil Spill Prevention and Response
PA	Public Assistance
PC	Personal Computer
PDA	Preliminary Damage Assessment
PIO	Public Information Office
POST	Police Officer Standards and Training
PPA/CA	Performance Partnership Agreement/Cooperative Agreement (FEMA)
PSA	Public Service Announcement
PTAB	Planning and Technological Assistance Branch
PTR	Project Time Report
RA	Regional Administrator (OES)
RADEF	Radiological Defense (program)
RAMP	Regional Assessment of Mitigation Priorities
RAPID	Railroad Accident Prevention & Immediate Deployment
RDO	Radiological Defense Officer
RDMHC	Regional Disaster Medical Health Coordinator
REOC	Regional Emergency Operations Center
REPI	Reserve Emergency Public Information
RES	Regional Emergency Staff
RIMS	Response Information Management System
RMP	Risk Management Plan
RPU	Radiological Preparedness Unit (OES)
RRT	Regional Response Team
SAM	State Administrative Manual
SARA	Superfund Amendments & Reauthorization Act
SAVP	Safety Assessment Volunteer Program
SBA	Small Business Administration
SCO	California State Controller's Office
SEMS	Standardized Emergency Management System
SEPIC	State Emergency Public Information Committee
SLA	State and Local Assistance
SONGS	San Onofre Nuclear Generating Station
SOP	Standard Operating Procedure

SWEPC	Statewide Emergency Planning Committee
TEC	Travel Expense Claim
TRU	Transuranic
TTT	Train the Trainer
UPA	Unified Program Account
UPS	Uninterrupted Power Source
USAR	Urban Search and Rescue
USGS	United States Geological Survey
WC	California State Warning Center
WAN	Wide Area Network
WIPP	Waste Isolation Pilot Project

Acceleration	The rate of change of velocity with respect to time. Acceleration due to gravity at the earth's surface is 9.8 meters per second squared. That means that every second that something falls toward the surface of earth its velocity increases by 9.8 meters per second.
Asset	Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.
Base Flood	Flood that has a 1 percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.
Base Flood Elevation (BFE)	Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as the standard for the National Flood Insurance Program.
Bedrock	The solid rock that underlies loose material, such as soil, sand, clay, or gravel.
Building	A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.
Coastal High Hazard Area	Area, usually along an open coast, bay, or inlet, that is subject to inundation by storm surge and, in some instances, wave action caused by storms or seismic sources.
Coastal Zones	The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.
Community Rating System (CRS)	An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of policyholders in these communities are reduced.
Computer-Aided Design And Drafting (CADD)	A computerized system enabling quick and accurate electronic 2-D and 3-D drawings, topographic mapping, site plans, and profile/cross-section drawings.
Contour	A line of equal ground elevation on a topographic (contour) map.

Critical Facility	Facilities that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
Debris	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
Digitize	To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer applications.
Displacement Time	The average time (in days) which the building's occupants typically must operate from a temporary location while repairs are made to the original building due to damages resulting from a hazard event.
Duration	How long a hazard event lasts.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
Erosion	Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.
Erosion Hazard Area	Area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.
Essential Facility	Elements that are important to ensure a full recovery of a community or state following a hazard event. These would include: government functions, major employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.
Extent	The size of an area affected by a hazard or hazard event.
Extratropical Cyclone	Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. These cyclonic storms, commonly called Nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large – 1,000-mile wide storms are not uncommon.

Fault	A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the plane of fracture.
Federal Emergency Management Agency (FEMA)	Independent agency created in 1978 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response and recovery.
Fire Potential Index (FPI)	Developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geographic information, national policy makers and on-the-ground fire managers established priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage suppression forces to high fire risk areas.
Flash Flood	A flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood	A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.
Flood Depth	Height of the flood water surface above the ground surface.
Flood Elevation	Elevation of the water surface above an established datum, e.g. National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or Mean Sea Level.
Flood Hazard Area	The area shown to be inundated by a flood of a given magnitude on a map.
Flood Insurance Rate Map (FIRM)	Map of a community, prepared by the Federal Emergency Management Agency, that shows both the special flood hazard areas and the risk premium zones applicable to the community.
Flood Insurance Study (FIS)	A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.
Floodplain	Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.

Frequency	A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance – its probability – of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.
Fujita Scale of Tornado Intensity	Rates tornadoes with numeric values from F0 to F5 based on tornado windspeed and damage sustained. An F0 indicates minimal damage such as broken tree limbs or signs, while and F5 indicated severe damage sustained.
Functional Downtime	The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.
Geographic Area Impacted	The physical area in which the effects of the hazard are experienced.
Geographic Information Systems (GIS)	A computer software application that relates physical features on the earth to a database to be used for mapping and analysis.
Ground Motion	The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions
Hazard	A source of potential danger or adverse condition. Hazards in this how to series will include naturally occurring events such as floods, earthquakes, tornadoes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.
Hazard Event	A specific occurrence of a particular type of hazard.
Hazard Identification	The process of identifying hazards that threaten an area.
Hazard Mitigation	Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.
Hazard Profile	A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

HAZUS (Hazards U.S.)	A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA.
Hurricane	An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74-miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the north Atlantic Ocean, northeast Pacific Ocean, or the south Pacific Ocean east of 160°E longitude. Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
Hydrology	The science of dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.
Infrastructure	Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, and includes an area's transportation system such as airports, heliports; highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, drydocks, piers and regional dams.
Intensity	A measure of the effects of a hazard event at a particular place.
Landslide	Downward movement of a slope and materials under the force of gravity.
Lateral Spreads	Develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies in a seismic event. The phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength.
Liquefaction	Results when the soil supporting structures liquefies. This can cause structures to tip and topple.
Lowest Floor	Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure.
Magnitude	A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.

Mitigation Plan	A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions to minimize future vulnerability to hazards.
National Flood Insurance Program (NFIP)	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 CFR §60.3.
National Geodetic Vertical Datum of 1929 (NGVD)	Datum established in 1929 and used in the NFIP as a basis for measuring flood, ground, and structural elevations, previously referred to as Sea Level Datum or Mean Sea Level. The Base Flood Elevations shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD.
National Weather Service (NWS)	Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.
Nor'easter	An extra-tropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain.
Outflow	Follows water inundation creating strong currents that rip at structures and pound them with debris, and erode beaches and coastal structures.
Planimetric	Describes maps that indicate only man-made features like buildings.
Planning	The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.
Probability	A statistical measure of the likelihood that a hazard event will occur.
Recurrence Interval	The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any given year.
Repetitive Loss Property	A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least $1000 each have been paid within any 10-year period since 1978.
Replacement Value	The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot, and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.
Richter Scale	A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935.

Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.
Riverine	Of or produced by a river.
Scale	A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.
Scarp	A steep slope.
Scour	Removal of soil or fill material by the flow of flood waters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.
Seismicity	Describes the likelihood of an area being subject to earthquakes.
Special Flood Hazard Area (SFHA)	An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year (100-year floodplain); represented on Flood Insurance Rate Maps by darkly shaded areas with zone designations that include the letter A or V.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.
State Hazard Mitigation Officer (SHMO)	The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and postdisaster mitigation activities.
Storm Surge	Rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface.
Structure	Something constructed. (See also Building)
Substantial Damage	Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage.

Super Typhoon	A typhoon with maximum sustained winds of 150 mph or more.
Surface Faulting	The differential movement of two sides of a fracture – in other words, the location where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults.
Tectonic Plate	Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.
Topographic	Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.
Tornado	A violently rotating column of air extending from a thunderstorm to the ground.
Tropical Cyclone	A generic term for a cyclonic, low-pressure system over tropical or subtropical waters.
Tropical Depression	A tropical cyclone with maximum sustained winds of less than 39 mph.
Tropical Storm	A tropical cyclone with maximum sustained winds greater than 39 mph and less than 74 mph.
Tsunami	Great sea wave produced by submarine earth movement or volcanic eruption.
Typhoon	A special category of tropical cyclone peculiar to the western North Pacific Basin, frequently affecting areas in the vicinity of Guam and the North Mariana Islands. Typhoons whose maximum sustained winds attain or exceed 150 mph are called super typhoons.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.
Vulnerability Assessment	The extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

Water Displacement	When a large mass of earth on the ocean bottom sinks or uplifts, the column of water directly above it is displaced, forming the tsunami wave. The rate of displacement, motion of the ocean floor at the epicenter, the amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.
Wave Runup	The height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).
Wildfire	An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.
Zone	A geographical area shown on a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding in the area.

California Disasters Since 1950

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Flood	Floods	OCD 50-01	1950	Statewide	11/21/50	Not declared	9		$32,183,000
Flood	Fire, Flood, and Erosion	DR-28	1954	Los Angeles, San Bernardino	2/5/54	2/5/54			Not Avail
Flood	Floods	DR-47	1955	Statewide	12/22/55	12/23/55	74		$200,000,000
Fire	Fires	DR-65	1956	Los Angeles (Malibu area), Ventura		12/29/56	1	Several hundred	$70,000,000
Severe Storm, Economic	Unseasonal and Heavy Rainfall	N/A	1957	Cherry producing areas of Northern California	5/20/57	Not declared		2	$6,000,000
Fire	Fires	CDO 58-01	1958	Los Angeles	1/3/58	Not declared	1	23	Not available
Tsunami	High Tides	CDO 58-02	1958	City of Imperial Beach, San Diego County	1/31/58	Not declared			Not available
Flood	Storm & Flood Damage	CDO 58-03	1958	Northern California (Southern boundaries of Santa Cruz, Santa Clara, Stanislaus, Tuolumne, Alpine counties to the Oregon border)	2/26/58	Not declared			Not available
Flood	Storm & Flood Damage	N/A	1958	Statewide	4/2/58	82	13		$24,000,000
Flood, Landslide	Potential Flood Damage and Landsides as a Result of Fires	CDO 59-01	1959	Los Angeles	1/8/59	Not declared			Not applicable
Severe Storm	Unseasonal and Heavy Rainfall	N/A	1959	Tokay grape producing areas of Northern California	9/17/59	Not declared	2		$100,000
Fire	Major and Widespread Fires	N/A	1960	Los Angeles, San Bernardino	7/21-22/60	Not declared		12	$10,000,000
Fire	Major and Widespread Fires	N/A	1960	Lassen Plumas, Shasta, Sierra, Tehama	8/16/60	Not declared			$3,075,000
Fire	Bel Air Fires	DR-119	1961	Los Angeles		11/16/61		103	Between $50,000,000 - $100,000,000
Fire	Widespread Fires	N/A	1961	Amador, Butte, El Dorado, Napa, Nevada, Placer, San Diego, Sonoma, Tehama	9/8/61	Not declared			$5,696,813
Flood	High Tides and Waves Caused By Storms At Sea	N/A	1961	Ventura	1/16/61	Not declared			Not available
Flood	Flood and Rainstorm	DR-122	1962	Los Angeles, Ventura	2/16/62 & 2/23/62	3/6/62			Not available
Fire	Fires and Explosions	N/A	1962	Alameda	9/14/62	Not declared	1	12	$500,000
Flood	Flood and Rainstorm		1962	Alameda, Butte, Contra Costa, Modoc, Napa San Mateo, Sierra, Sutter, Yuba, Placer, Trinity, Lassen	10/17/62, 10/25/62, 10/30,62, & 11/4/62	138 (10/24/62)			$4,000,000
Flood	Baldwin Hills Dam Failure	DR-161	1963	Los Angeles	12/16/63	12/21/63			$5,233,203
Flood	High Tides and Heavy Surf	N/A	1963	Orange, City of Redondo Beach		Not declared	5		$500,000

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Severe Storm, Flood	Abnormally Heavy and Continuous Rainfall	N/A	1963	Northern California (boundaries of San Luis Obispo, Ventura, Los Angeles, and San Bernardino counties to the Oregon State Line	2/14/64	Not declared			Not Available
Flood	Flood and Rainstorm	Unknown	1963	Alpine, Nevada, Placer, Plumas, Sierra, Amador, Colusa, El Dorado, Glenn, Lake, Lassen, Tehama, Santa Clara, Santa Cruz, Siskiyou, Yolo, Tulare, Mono, Trinity, Yuba	2/7/63, 2/26/63, 2/29/63, & 4/22/63	145 (2/25/63)			Not available
Fire	Major Widespread Fires (Weldon Fire)	N/A	1964	Los Angeles	3/16/64	Not declared			$2,000,000
Fire, Windstorm	Major and Widespread Fires and Excessively High Winds	N/A	1964	Napa, Sonoma, Santa Barbara	9/22/64, 9/23/64, & 9/25/64	Not declared			$16,500,000
Flood	Storms	N/A	1964	Los Angeles	4/3/64	Not declared			1,610,300
Severe Storm, Flood	Abnormally Heavy and Continuous Rainfall	N/A	1964	Humboldt	2/10/64	Not declared			$1,407,000
Tsunami	Tsunami Caused by 1964 Earthquake in Alaska	N/A	1964	Marin	9/15/64	Not declared			Not applicable
Flood	1964 Late Winter Storms	Unknown	1964	Del Norte, Humboldt, Shasta, Mendocino, Colusa, Glenn, Lassen, Plumas, Sierra, Siskiyou, Sonoma, Sutter, Tehama, Trinity, Amador, Butte, El Dorado, Modoc, Nevada, Placer, Yuba, Alpine, Lake, Sacramento, Yolo, Marin	12/22/64, 12/23/64, 12/28/64, 1/5/65, & 1/1/65	12/29/64			$213,149,000
Tsunami	Tsunami Caused by Alaska Earthquake	Unknown	1964	Del Norte	3/28/64	169 (4/1/64)	12		$10,000,000
Civil Unrest	Riots	N/A	1965	Los Angeles	8/14/65	Not declared	32	874	$44,991,000
Fire	Major and Widespread Fires	N/A	1965	Marin, Napa, Placer, Solano, Sonoma	9/18/65	Not declared			Not available
Flood, Landslide	Flooding and Hill Slides Caused by Heavy Rains	N/A	1965	City of Burbank, Los Angeles	1/5/65	Not declared			Not Available
Landslide	Slide Damage	N/A	1965	City of Los Angeles	6/21/65	Not declared			$6,488,600
Flood, Severe Storm	1965 Heavy Rainfall		1965	Riverside, San Bernardino, Ventura, San Diego	11/24/65, 11/26/65, 12/23/65	12/7/65			$21,843,739
Flood	Continuous Rainfall	DR-211	1966	Humboldt	1/14/66	212 (1/22/66)			$6,918,000.00
Civil Unrest	Riots	N/A	1966	San Francisco	9/27/66	Not declared		42	Not available
Landslide	Earth slides	N/A	1966	Redwood City	12/16/66	Not declared			$100,000

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Flood	1966 Winter Storms	Unknown	1966	Kern, Riverside, Tulare, San Bernardino, San Luis Obispo, Monterey, City of Escondido, Inyo	12/9/66, 12/13/66, 12/16/66, 12/16/66, & 12/23/66	1/2/67			$28,761,041.00
Fire	Major and Widespread Fires	N/A	1967	Los Angeles, Orange, San Diego, Ventura	1/7/67	Not declared			$11,345,000
Civil Unrest	Riots and Other Conditions	N/A	1968	City of Richmond	8/2/68	Not declared			Not applicable
Civil Unrest	Riots	N/A	1969	City of Berkeley	2/5/69	Not declared	0	20	Not available
Freeze	Extremely Severe Weather; Freezing	N/A	1969	San Diego	2/5/69	Not declared			$10,000,000
HazMat	Major Oil Spill	N/A	1969	Coastal Areas of Southern California		Not declared			Not available
Flood	1969 Storms	Unknown	1969	Los Angeles, San Luis Obispo, Fresno, Inyo, Riverside, San Bernardino, Santa Barbara, Tulare, Ventura, Amador, El Dorado, Kern, Kings, Madera, Modoc, Mono, Monterey, Orange, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Tuolumne, Mariposa, Merced, Calaveras, San Benito, Sierra, Contra Costa, Humboldt, Mendocino, Sonoma, Plumas, Tehama, Yuba, Butte, Marin, Yolo	1/23/69, 1/25,69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	1/26/69	47	161	$300,000,000
Flood	Heavy Snow Runoff		1969	Kings	1/28/96	8/15/69			$2,812,500.00
Civil Unrest	Riots and Disorders	N/A	1970	Santa Barbara	2/26/70	Not declared		12+	$300,000
Fire	Large Fire	N/A	1970	City of Sonora, Tuolumne	2/26/70	Not declared			$2,300,000
Fire	Widespread Fires	N/A	1970	Riverside	12/22/70	Not declared			$3,200,000
Flood	Storms and Floods	N/A	1970	Contra Costa	4/10/70	Not declared			Not available
Freeze	Freezing Conditions	N/A	1970	Napa, Sonoma, Mendocino, San Joaquin, Lake	5/1/70, 5/19/70, 6/8/70, 6/10/70, 7/24/70	Not declared			$19,749,200
Landslide	Slide Damage Caused by Heavy Rains and Storms	N/A	1970	City of Oakland	2/10/70	Not declared			$11,500,000
Landslide	Slide Damage Caused by Heavy Rains and Storms	N/A	1970	City of Los Angeles	3/10/70	Not declared			$8,500,000
Flood	Northern California Flooding	Unknown	1970	Butte, Colusa, Glenn, Lake, Lassen, Marin, Modoc, Plumas, Shasta, Siskiyou, Tehama, Trinity, Sutter, Yuba, Del Norte, Alameda, El Dorado,	1/26/60, 2/3/60, 2/10/60, 3/2/60	2/16/70			$27,657,478

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
				Mendocino					
Fire	Statewide Fires		1970	City of Oakland, Los Angeles, Ventura, San Diego, Kern, San Bernardino, Monterey, Riverside	9/24/70, 9/28/70, 10/1/70, 10/2/70, 10/20/70, 11/14/70	9/29/70	19		$223,611,000
Earthquake	San Fernando Earthquake	DR-299	1971	Los Angeles	2/9/71	2/9/71	58	2,000	$483,957,000
Fire	Widespread Fires	N/A	1971	Santa Barbara	10/13/71	Not declared	4		$9,000,000
Flood	High Ocean Tides and Wind-driven Waves	N/A	1971	Ventura	5/19/71	Not declared			$250,000
Flood	1972 Storms	DR-316	1972	Santa Barbara	1/3/72	2/11/72			$2,660,000
Flood	Andrus island Levee Break	DR-342	1972	Sacramento	6/21/72	6/27/72			$23,681,630
Agricultural	Exotic Newcastle Disease Epidemic	N/A	1972	Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura, Santa Barbara	4/10/72, 5/22/72	Not declared			$10,000,000
Drought	Drought Conditions	N/A	1972	Glenn, San Benito, Santa Clara	7//73	Not declared			$8,000,000
Flood	Heavy Rains and Mud Slides	N/A	1972	Monterey	10/24/72	Not declared			$720,000
Severe Storm	Severe Weather Conditions	N/A	1972	Sutter	9/3/72	Not declared			$2,004,300
Severe Storm, Freeze	Freeze and Severe Weather Conditions	N/A	1972	Fresno, Kings, Tulare, Merced, Kern, Madera, San Benito, Stanislaus, El Dorado, Tehama, Placer, Nevada, San Joaquin, Colusa, Siskiyou, Modoc, Santa Clara	4/17/72, 5/22/72, 5/22/72, 5/31/72	Not declared			$111,517,260
Flood	1972 Continuing Storms		1972	Del Norte, Humboldt	2/28/72	4/5/72			$6,817,618
Flood	Coastal Flooding	DR-364	1973	Marin, San Luis Obispo, City of South San Francisco, Santa Barbara, Solano, Ventura	1/23/73, 1/30/73, 2/8/73, 2/28/73	2/3/73			$17,998,250
Fire	Southern Pacific Railroad Fires and Explosions (Roseville)	N/A	1973	Sacramento, placer	4/30/73	Not declared	0	37	$2,925,000
Fire	Boulder Fire	N/A	1973	San Diego	12/12/73	Not declared	0		$215,700
Flood	High Ocean Tides and Wind-driven Waves	N/A	1973	Ventura	2/1/73	Not declared			$1,027,000
Flood	Storms and Floods	N/A	1973	Colusa, Glenn, Napa, Placer, Sutter, Yuba	2/28/73	Not declared			$1,864,000
Flood	Storms and Floods	N/A	1973	Mendocino	3/15/73	Not declared			$1,523,200
Flood	Storms and Floods	N/A	1973	City of Pacifica	4/11/73	Not declared			$700,000
Freeze	Freeze	N/A	1973	Butte	2/28/73	Not declared			$300,000
Freeze, Economic	Eucalyptus Tree Freeze	Unknown	1973	Alameda, Contra Costa	4/4/73	5/25/73			$8,000,000 to $10,000,000

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Fire	Fires	N/A	1973	Los Angeles	7/16/73	Not declared			$1,300,000
Flood	Storms	DR-412	1974	Humboldt, Shasta, Siskiyou, Trinity, Glenn, Mendocino, Tehama	1/17/74, 1/18/74	1/25/74			$35,192,500
Flood	Storms	DR-432	1974	Mendocino	4/23/74	5/7/74			$4,475,900
Economic	Gasoline Purchasing Problems	N/A	1974	Alameda, Contra Costa, Los Angeles, Orange, Riverside, San Mateo, Solano, Santa Clara, Ventura	2/28/74, 3/4/74, 3/10/74	Not declared			
Flood	Storms	N/A	1974	Santa Cruz	2/28/74	Not declared			$763,267
Fire	Fires	N/A	1975	Los Angeles	11/24/75	Not declared			$19,486,960
Drought	Drought	N/A	1976	Alpine, Calaveras, Colusa, Fresno, Glenn, Madera, Merced, San Diego, San Joaquin, Solano, Stanislaus, Sutter, Tuolumne, Alameda, Butte, Contra Costa, Kings, Los Angeles, Riverside, San Luis Obispo, Tulare, Yolo, Amador, Monterey, Napa, Nevada, San Benito, San Bernardino, Tehama, San Mateo, Marin	2/9/76, 2/13,76, 2/24/76, 3/26/76, 7/6/76	Not declared			$2,664,000,000
Severe Storm	1976 High Winds and Flooding	DR-521	1976	Imperial, Riverside, San Bernardino, San Diego	9/13/76, 9/22/76	9/21/76			$120,132,771
Fire	Sycamore Fire	N/A	1977	Santa Barbara	7/27/77	Not declared	0		$25,540,755
Flood	Imperial County Flooding	N/A	1977	Imperial	8/23/77	Not declared			$28,498,469
Flood, Landslide	Threat of Floods/Mud Slides	N/A	1977	Monterey, Riverside	9/8/77	Not declared			$6,110,000
Severe Storm	Storms	N/A	1977	San Diego, Kern, Humboldt, City of Arvin	1/10/78, 12/23/77, 1/22/77, 12/21/77	Not declared			$38,009,035
Landslide	Laguna Landslide	DR-566	1978	City of Laguna Beach	10/5/78	10/9/78			$16,595,000
Fire	1978 Los Angeles Fire	EM-3067	1978	Los Angeles	10/24/78	10/29/78	1		$61,279,374
Earthquake	Santa Barbara Earthquake	N/A	1978	Santa Barbara	8/15/78	Not declared	0	65	$12,987,000
Miscellaneous	PSA Air Crash	N/A	1978	City of San Diego	1/15/79	Not declared	150		
Severe Storm	Storms	N/A	1978	Humboldt, Mendocino, Santa Cruz	1/27/78, 1/20/78	Not declared			$6,126,409
Severe Storm	Storms	Unknown	1978	Inyo, Mono, San Diego, San Luis Obispo, Kings, Monterey, Kern, Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Tulare, Ventura	3/9/78, 2/27,78, 2/13/78	2/15/78	14	21	$117,802,785
Severe Storm	Severe Storms	DR-594	1979	Riverside	7/26/80	7/27/79			$25,867,100
Earthquake	Imperial Earthquake	DR-609	1979	Imperial	10/16/79	10/16/79	0	91	$21,197,250
Economic	Gasoline Shortage	N/A	1979	Alameda, Contra Costa, Los Angeles, Marin,	5/8/79 - 11/13/79	Not declared			

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
	Emergency			Monterey, Orange, Riverside, San Francisco, San Diego, Santa Clara, Santa Cruz, San Mateo, Ventura, San Bernardino, Sonoma, Contra Costa, Los Angeles, Orange, Santa Clara					
Fire	Fires	N/A	1979	Santa Barbara, Ventura, Los Angeles, El Dorado	9/28/79, 9/21/79, 9/20/79	Not declared			$9,970,119
Flood	1980 Winter Storms	DR-615	1980	Santa Barbara, Los Angeles, Orange, Riverside, Ventura, San Bernardino, San Diego	2/21/80, 2/7/80	2/21/80			
Flood	Jones Tract Levee Break	DR-633	1980	San Joaquin	9/30/80	9/30/80			$21,510,956
Fire	Southern California Fires	DR-635	1980	San Bernardino, Los Angeles, Orange, Riverside	11/18/80	11/18/80			$64,795,200
Flood	Delta Levee Break	EM-3078	1980	Contra Costa, Sacramento, San Joaquin	1/23/80	1/23/80			$17,388,013
Earthquake	Owens Valley Earthquake	N/A	1980	Mono	5/28/80	Not declared	0	9	$2,000,000
Flood	Storms	N/A	1980	Stanislaus, Monterey, Solano, Santa Cruz	3/5/80	Not declared			$316,640,817
Economic	Mediterranean Fruit Fly Infestation	N/A	1981	Contra Costa, Los Angeles, San Benito, Stanislaus, Santa Cruz, San Mateo	8/8/81 - 9/25/81	Not declared			$22,000,000
Fire	Atlas Peak Fire	N/A	1981	Napa	6/24/81	Not declared	0		$31,000,000
Flood	1982 Winter Storms	DR-651	1982	Alameda, Santa Clara, Solano, San Joaquin, Contra Costa, Humboldt, Marin, San Mateo, Santa Cruz, Sonoma	1/5/82 - 1/9/82	1/7/82	33	481	$273,850,000
Fire	Orange Fire	DR-657	1982	Orange, City of Redondo Beach	4/21/82	4/21/82			$50,877,040
Flood	McDonald Island Levee Break	DR-669	1982	MacDonald Island	8/24/82	8/24/82			$11,561,870
Flood, Severe Storm	1982-83 Winter Storms	DR-677	1982	Contra Costa, San Joaquin, Sacramento, Marin, San Mateo, Los Angeles, San Diego, Alameda, Orange, San Benito, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Sonoma, Ventura, Trinity, Colusa, Lake, Mendocino, Monterey, San Luis Obispo, Solano, Yolo, Butte, Glenn, Kern, Kings, San Bernardino, Sutter, Tehama, Merced, Del Norte, Fresno, madera, Napa, Placer, Riverside, Stanislaus, Tulare, Humboldt, Mariposa, Nevada, Yuba	1982, 1983	2/9/83	0	0	$523,617,032
Agricultural	Rains Causing Agricultural Losses	N/A	1982	Fresno, Madera, Merced, Monterey, kenr Tulare, Sacramento, San Joaquin, Solano, Stanislaus, Yolo	10/26/82	Not declared			$345,195,974
Fire	Dayton Hills Fire	N/A	1982	Los Angeles, Orange, Ventura	10/10/82	Not declared	0		$19,277,102

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Flood, Windstorm	High Tides, Strong Winds, and Rains	N/A	1982	Contra Costa, Sacramento, San Joaquin	12/8/82	Not declared			$6,964,998
Severe Storm, Flood	Heavy Rains/ Flooding	N/A	1982	Inyo	9/27/82	Not declared			$6,161,320
Flood	Winter Storms	Unknown	1982	Contra Costa, San Joaquin, Sacramento, Marin, San Mateo, Los Angeles, San Diego, Alameda, orange, San Benito, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Sonoma, Ventura, Trinity, Colusa, Lake Mendocino, Monterey, San Luis Obispo, Solano, Yolo, Butte, Glenn, Kern, Kings, San Bernardino, Sutter, Tehama, Merced, Del Norte, Fresno, Madera, Napa, Placer, Riverside, Stanislaus, Tulare, Humboldt, Mariposa, Nevada, Yuba	12/8/82-3/21/83	2/9/83			$523,617,032
Earthquake	Coalinga Earthquake	DR-682	1983	Fresno	5/2/83	5/3/83	0	47	$31,076,300
Flood	Colorado River Flooding	DR-682	1983	Riverside, San Bernardino, Imperial	6/23/83, 6/28/83	7/1/83			$4,640,315
Flood	1983 Summer Storms	DR-690	1983	Inyo, Riverside, San Bernardino	8/29/83	8/29/83	3		$34,689,155
Economic	Mexican Fruit Fly	N/A	1983	Los Angeles	11/4/83	Not declared			
Severe Storm, Flood	Levee Failure, High Winds, High Tides, Floods, Storms, Wind Driven Water	N/A	1983	Contra Costa, Alameda	12/9/83, 1/18/84	Not declared			$10,909,785
Earthquake	Morgan Hill Earthquake	EM-4043	1984	Santa Clara		4/25/84	0	27	$7,265,000
Severe Storm	Storms	N/A	1984	Kern, Riverside, Tulare, San Bernardino, San Luis Obispo, Monterey, City of Escondido, Inyo		Not declared			$1,600,000
Fire	Statewide Fires	DR-739	1985	San Diego, City of Lost Angeles, San Luis Obispo, Monterey, Santa Clara, Santa Cruz, Ventura	7/1/85 - 7/11/85	4/25/84	3	470	$64,845,864
Fire	Wheeler Fire	N/A	1985	Ventura	10/14/85	Not declared	1	2	
Miscellaneous	Hydrilla Proliferation	N/A	1985	Shasta	9/13/85	Not declared			
Severe Storm	Storms	DR-758	1986	Humboldt, Napa, Sonoma, Glenn, Lake, Marin, Modoc, Sacramento, Santa Clara, Santa Cruz, Solano, Yuba, Alpine, Amador, Butte, Calaveras, Colusa, El Dorado, Lassen, Mendocino, Nevada, Placer, Plumas, San	2/18-86 - 3/12/86	2/18/86	13		$407,538,904

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
				Joaquin, Sierra, Sutter, Tehama, Tuolumne, Yolo, Fresno, Madera, San Mateo, Alameda, Contra Costa, Del Norte, Trinity, Mono, San Benito, Shasta					
Flood	Heavy Rains	N/A	1986	Monterey, Siskyou	3/26/86	Not declared			$400,000
Miscellaneous	Plane Crash	N/A	1986	City of Cerritos	8/31/86	Not declared	67	2	
Earthquake	Whittier Earthquake	DR-799	1987	Monterey park, City of Whittier, Los Angeles, Orange	10/2/87 - 10/5/87	10/7/87	9	200	$358,052,144
Earthquake	Imperial County Earthquake	N/A	1987	Imperial	11/23/87	Not declared	0	94	$2,638,833
Economic	Mediterranean Fruit Fly	N/A	1987	Los Angeles	8/25/87	Not declared			
Fire	Forest Fire - Del Norte Fire, Pebble Beach	N/A	1987	Monterey		Not declared	0	8	$15,000,000
Fire	Acorn Fire	N/A	1987	Alpine	8/3/87	Not declared	0	3	$8,500,000
Fire	Wildland Fires	N/A	1987	Colusa, Del Norte, Butte, Fresno, Humboldt, Inyo, Kern, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Placer, Plumas, Riverside, San Bernardino, Shasta, Sierra, Siskiyou, Trinity, Tulare, Tuolumne	9/10/87, 9/3/87	Not declared	3	76	$18,000,000
Fire	Wildfires/ Flooding/ Mud Slides	N/A	1987	San Diego	11/19/87	Not declared			$5,371,150
Severe Storm	Coastal Storms	DR-812	1988	Los Angeles, Orange, San Diego	1/21/88	2/5/88	0		
Fire	Fires - 49er, Miller, and Fern	DR-815	1988	Shasta, Solano, Yuba, Nevada	9/11/88- 9/20/88	9/13/88	0		$31,247,534
Economic	Mediterranean Fruit Fly	N/A	1988	Los Angeles	7/21/88	Not declared			
Fire	Wildland Fires	N/A	1988	Calaveras	7/21/88	Not declared			
Fire, Windstorm	Fire and Wind Driven Waves	N/A	1988	City of Redondo Beach	6/15/88	Not declared	0		$25,000,000
Fire, Windstorm	Fires/ High Winds	N/A	1988	Los Angeles	12/9/88	Not declared	0	2	$12,400,000
Severe Storm	Storms	N/A	1988	Santa Barbara, City of San Buenaventura	1/26/88	Not declared			$49,416,200
Earthquake	Loma Prieta Earthquake	DR-845	1989	Alameda, Monterey, San Benito, San Mateo, Santa Clara, Santa Cruz, San Francisco, Contra Costa, Marin, City of Isleton, City of Tracy, Solano	10/18/89 - 10/30/89	10/18/89	63	3,757	$5,900,000,000
Economic	Mediterranean Fruit Fly	N/A	1989	Los Angeles	8/9/89	Not declared			
Economic	Mediterranean Fruit Fly	N/A	1989	Santa Clara	9/6/89	Not declared			
Economic	Mediterranean Fruit Fly	N/A	1989	San Bernardino	10/3/89	Not declared			
Economic	Mediterranean Fruit Fly	N/A	1989	Orange	11/20/89	Not declared			
Fire	Santa Barbara Fires	DR-872	1990	Los Angeles, Santa Barbara, Riverside, San Bernardino	6/28/90, 6/29/90	6/30/90	3	89	$300,000,000
Freeze	Freeze	DR-894	1990	Santa Cruz, Fresno,	12/19/90-	2/11/91			$856,329,675

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
				Glenn, imperial, Kern, Mendocino, Monterey, Riverside, San Benito, San Bernardino, San Diego, San Mateo, Santa Barbara, Santa Clara, Solano, Sonoma, Tulare, Ventura, Alameda, Butte, Colusa, Los Angeles, Madera, Marin, Merced, Napa, San Joaquin, San Luis Obispo, Sutter, Yolo, Yuba, Stanislaus, Tehama	1/18/91				
Drought	Drought	N/A	1990	City of Santa Barbara	7/17/90	Not declared			
Drought	Drought	N/A	1990	Santa Barbara	11/13/90	Not declared			
Earthquake	Upland Earthquake	N/A	1990	Los Angeles, San Bernardino	3/9/90, 3/13/90	Not declared	0	38	$12,034,150
Economic	Mediterranean Fruit Fly	N/A	1990	Riverside	4/18/90	Not declared			
Economic	Mexican Fruit Fly	N/A	1990	Los Angeles, San Diego	5/14/90	Not declared			
Fire	Finley Fire/ Yosemite Fire	N/A	1990	Mariposa, Kern, Tehama	8/13/90, 8/14/90	Not declared	1	84	$548,000,000
Severe Storm	Severe Storms	N/A	1990	Butte, Nevada	2/22/90	Not declared	1	17	$11,500,000
Fire	East Bay Hills Fire	DR-919	1991	Alameda County	10/20/91	10/22/91	25	150	$1,700,000,000
Economic	Sweet potato Whitefly	N/A	1991	Imperial, Riverside		Not declared			$120,567,949
HazMat	Cantara Spill	N/A	1991	Shasta, Siskyou				300	$38,000,000
Severe Storm	1992 Winter Storms	DR-935	1992	Los Angeles, Ventura, City of Los Angeles, kern, orange, San Bernardino	2/12/92, 2/19/92	2/25/92	5		$123,240,531
Civil Unrest	Los Angeles Civil Disorder	DR-942	1992	Los Angeles	4/29/92	5/22/92	53	2,383	$800,000,000
Earthquake	Cape Mendocino Earthquakes	DR-943	1992	Humboldt	4/25/92	5/5/92	0	356	$48,271,137
Earthquake	Big Bear - Landers Earthquakes	DR-947	1992	Riverside, San Bernardino	6/28/92	6/28/92	1	$402	$91,079,376
Fire	Shasta/Calaveras Fire	DR-958	1992	Calaveras, Shasta	8/21/92	8/29/92	0	$8	$54,108,500
Flood	1992 Late Winter Storms	DR-979	1992	Alpine, Los Angeles, Humboldt, Napa, Santa Barbara, Culver City, City of Los Angeles, Contra Costa, Mendocino, Sonoma, Fresno, imperial, Madera, Monterey, San Bernardino, Sierra, Tehama, Trinity, Tulare, Modoc, Orange, Riverside, Lassen, Siskiyou, Plumas, San Diego	1/7/93 - 2/19/93	1/15/93	20	10	$600,000,000
HazMat	Sewage Spill	N/A	1992	San Diego, City of Chula Vista, City of Coronado, San Diego	2/6/92, 2/7/92	Not declared			
Fire	Southern California Firestorms	DR-1005	1993	Los Angeles, Ventura, San Diego, Orange, Riverside, San Bernardino	10/27/93, 10/28/93	10/28/93	4	162	$1,000,000,000
Economic	Mediterranean Fruit Fly	N/A	1993	Riverside	5/21/94	Not declared			
HazMat	Tijuana River Pollution	N/A	1993	San Diego	9/10/93	Not declared			

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
HazMat	New River Pollution	N/A	1993	Imperial	10/6/93	Not declared			
Earthquake	Northridge Earthquake	DR-1008	1994	Los Angeles, Ventura, Orange	1/17/94, 1/24/94	1/17/94	57	11,846	$40,000,000,000
Economic	Salmon fisheries	DR-1038	1994	Del Norte, Humboldt, Mendocino, Sonoma	5/20/94	9/20/94			$28,300,000
Earthquake	Humboldt Earthquake	N/A	1994	Humboldt	12/29/94	Not declared			$1,300,000
Economic	Mediterranean Fruit Fly	N/A	1994	Ventura	10/7/94	Not declared			
Fire	San Luis Obispo Fire - Hwy 41	N/A	1994	San Luis Obispo	8/24/94	Not declared		12	$6,382,235
Severe Storm	Severe Winter Storms	DR-1044	1995	Los Angeles, Orange, Humboldt, Lake , Sonoma, Butte, Colusa, Contra Costa, Del Norte, Glenn, Kern, Lassen, Mendocino, Modoc, Monterey, Napa, placer, Plumas, San Luis Obispo, Santa Barbara, Santa Clara, Santa Cruz, Tehama, Ventura, Yolo, Yuba, Alpine, Amador, Nevada, Riverside, Sacramento, San Bernardino, San Mateo, Shasta, Sutter, Trinity, San Diego, Alameda, Marin, Fresno, Kings, El Dorado, Madera, Solano, Siskiyou	1/6/95 - 3/14/95	1/13/95	11		$741,400,000
Severe Storm, Flood	Late Winter Storms	DR-1046	1995	All counties except Del Norte		1/10/95	17		$1,100,000,000
Fire	Southern California Firestorms	EM-3120	1996	Los Angeles, Orange, San Diego	10/1/96			5	$40,000,000
Flood	January 1997 Floods		2003	Alpine, Amador, Butte, Colusa, Del Norte, El Dorado, Glenn, Humboldt, Lake, Lassen, Modoc, Napa, Nevada, Plumas, Sacrament, San Joaquin, Sierra, Siskiyou, Solano, Sonoma, Sutter, Tehama, Trinity, Yuba, Calaveras, Madera, Mono, Monterey, Placer, San Benito, San Luis Obispo, San Mateo, Santa Cruz, Shasta, Stanislaus, Tuolumne, Yolo, Contra Costa, Fresno, Marin, Tulare, Mariposa, Merced, Santa Clara, Alameda, San Francisco, Kings,	1/2/97 - 1/31/97		8		$1,800,000,000
Flood	El Nino		1998	Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, Fresno, Glenn Humboldt, Kern, Kings, Lake, Los Angeles, Marin, Mendocino, Merced, Monterey, Napa, Orange, Riverside, Sacramento, San Benito, San Bernardino, San Diego, San Francisco, San			17		$550,000,000

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
				Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Siskiyou, Solano, Sonoma, Stanislaus, Sutter, Tehama, Trinity, Tulare, Ventura, Yolo, Yuba					
Freeze	Freeze		1998	Fresno, Kern, Kings, Madera, Merced, Monterey, Tulare, Ventura	2/9/99				
Fire	Fire		1999	Various Counties	8/26/99				
	Road Damage		1999	Sonoma	3/29/99				
Earthquake	Earthquake		2000	Napa	9/6/00				
Drought	Water Shortage		2001	City of Rio Dell	3/16/01				
Fire	California Wildfires	DR-1498	2003	Ventura, LA, San Bernardino, Riverside, San Diego		DR1498			
Earthquake	Sierra Madre Earthquake	N/A	2003	Los Angeles	7/5/91	Not declared	1	30	$33,500,000
Fire	Widespread Fires	N/A	2003	Madera		Not declared	2		Not available
Severe Storm, Freeze	Freeze and Snow Conditions	N/A	2003	Lake	7/13/72	Not declared			$357,000
Drought	Drought		2003	Modoc, Siskiyou	5/4/01				
Economic	Exotic Newcastle Disease Epidemic		2003	15 Northern Counties	2/21/03				
Economic	Bark Beetle Infestation		2003	San Bernardino, San Diego, Riverside	3/7/03				
Fire	Wildfire		2003	Calaveras	9/10/01				
Fire	Southern California Wildfires	DR-1498	2003	Ventura, Los Angeles, San Bernardino, Riverside, San Diego	10/24-26/03	10/27/03			
Earthquake	San Simeon Earthquake	DR-1505	2003	San Luis Obispo, Santa Barbara	12/23/03	1/13/04			Estimated $55 million

Facility Name	CASTAIC	Primary Contact ID	Roland Williams
		Secondary Contact ID	Bruce Jackson
		Type	ERTH
CA State Dam Number	1-058	Capacity	323700
National ID	CA00044	Storage	
County	LOS ANGELES	Pct Full	
Owner	State of California-WR	Thomas Guide Page	4369-J3
Contact	Dick Butler	Inundation Map Number	9 -11

Facility Name	PEARBLOSSOM SPREADING BASIN	Primary Contact ID	Roland Williams
		Secondary Contact ID	Bruce Jackson
		Type	ERTH
CA State Dam Number	1-061	Capacity	106
National ID	CA00047	Storage	
County	LOS ANGELES	Pct Full	
Owner	State of California-WR	Thomas Guide Page	437-8
Contact	Area Control Center - Operator	Inundation Map Number	

Facility Name	PYRAMID	Primary Contact ID	Roland Williams
		Secondary Contact ID	Bruce Jackson
		Type	ROCK
CA State Dam Number	1-066	Capacity	180000
National ID	CA00052	Storage	
County	LOS ANGELES	Pct Full	
Owner	State of California-WR	Thomas Guide Page	
Contact	Dick Butler	Inundation Map Number	48 -3

Facility Name	J W WISDA	Primary Contact ID	Bob Heidinger
		Secondary Contact ID	Gilbert Hernandez
		Type	ERTH
CA State Dam Number	1-067	Capacity	45
National ID	CA00053	Storage	
County	LOS ANGELES	Pct Full	
Owner	State of California-P&R	Thomas Guide Page	
Contact	Bob Heidinger	Inundation Map Number	N/A

Facility Name	RESERVOIR NO 1	Primary Contact ID	Albert Lopez
		Secondary Contact ID	Kevin Mitchell
		Type	ERTH
CA State Dam Number	4-004	Capacity	21
National ID	CA00058	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Burbank	Thomas Guide Page	533-H5
Contact	Albert Lopez	Inundation Map Number	49 -1

Facility Name	RESERVOIR NO 4	Primary Contact ID	Albert Lopez
		Secondary Contact ID	Kevin Mitchell
		Type	RECT
CA State Dam Number	4-006	Capacity	34
National ID	CA00059	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Burbank	Thomas Guide Page	533-H6
Contact	Albert Lopez	Inundation Map Number	50 -1

Facility Name	RESERVOIR NO 5	Primary Contact ID	Albert Lopez
		Secondary Contact ID	Kevin Mitchell
		Type	RECT
CA State Dam Number	4-007	Capacity	77
National ID	CA00060	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Burbank	Thomas Guide Page	533-E3
Contact	Albert Lopez	Inundation Map Number	51 -1

Facility Name	BRAND PARK	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	ERTH
CA State Dam Number	5-000	Capacity	32
National ID	CA00061	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	534-C6
Contact	Dennis Maxwell	Inundation Map Number	8 -1

Facility Name	10TH AND WESTERN	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	ERTH
CA State Dam Number	5-004	Capacity	46
National ID	CA00062	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	534
Contact	Dennis Maxwell	Inundation Map Number	

Facility Name	CHEVY CHASE 968	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	ERTH
CA State Dam Number	5-005	Capacity	46
National ID	CA00063	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	565
Contact	Dennis Maxwell	Inundation Map Number	12 -1

Facility Name	DIEDERICH RESERVOIR	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	ERTH
CA State Dam Number	5-006	Capacity	174
National ID	CA00064	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	564
Contact	Dennis Maxwell	Inundation Map Number	

Facility Name	GLENOAKS 968 RESERVOIR	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	ERTH
CA State Dam Number	5-007	Capacity	28
National ID	CA00065	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	565-A4
Contact	Dennis Maxwell	Inundation Map Number	85 -1

Facility Name	CHATSWORTH	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	HYDF
CA State Dam Number	6-004	Capacity	9886
National ID	CA00067	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	529-G1
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	DRY CANYON	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	HYDF
CA State Dam Number	6-005	Capacity	1140
National ID	CA00068	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	4460-J1
Contact	Philip C. Lahr	Inundation Map Number	16 -1

Facility Name	ELYSIAN	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-006	Capacity	167
National ID	CA00069	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	594-H7
Contact	Philip C. Lahr	Inundation Map Number	19 -1

Facility Name	ENCINO	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-007	Capacity	9789
National ID	CA00070	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	561-B5
Contact	Philip C. Lahr	Inundation Map Number	20 -1

Facility Name	FAIRMONT	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	HYDF
CA State Dam Number	6-008	Capacity	7507
National ID	CA00071	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	-X
Contact	Philip C. Lahr	Inundation Map Number	21 -3

Facility Name	LOWER FRANKLIN	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	HYDF
CA State Dam Number	6-014	Capacity	920
National ID	CA00075	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	592-E4
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	LOWER SAN FERNANDO	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	HYDF
CA State Dam Number	6-015	Capacity	10000
National ID	CA00076	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	481
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	DRINKWATER	Primary Contact ID	Larry Gillis
		Secondary Contact ID	George Brodt
		Type	ERTH
CA State Dam Number	6-016	Capacity	92
National ID	CA00077	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	-X
Contact	Bill Spring	Inundation Map Number	

Facility Name	MULHOLLAND	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	GRAV
CA State Dam Number	6-017	Capacity	4036
National ID	CA00078	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	593-E1
Contact	Philip C. Lahr	Inundation Map Number	40 -2

Facility Name	ROWENA	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-018	Capacity	96
National ID	CA00079	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	594-C3
Contact	Philip C. Lahr	Inundation Map Number	53 -1

Facility Name	SILVER LAKE	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-051	Capacity	2020
National ID	CA00081	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	594-D4
Contact	Philip C. Lahr	Inundation Map Number	61 -2

Facility Name	STONE CANYON	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-025	Capacity	10372
National ID	CA00083	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	591
Contact	Philip C. Lahr	Inundation Map Number	62 -2

Facility Name	UPPER FRANKLIN	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-027	Capacity	118
National ID	CA00085	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	592-E2
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	UPPER SAN FERNANDO	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	HYDF
CA State Dam Number	6-028	Capacity	1848
National ID	CA00086	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	481
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	UPPER HOLLYWOOD	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-029	Capacity	176
National ID	CA00087	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	593-E1
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	BOUQUET CANYON	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-031	Capacity	36505
National ID	CA00088	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	4192-G7
Contact	Philip C. Lahr	Inundation Map Number	7 -3

Facility Name	CHANNEL DIVERSION DIKE	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-039	Capacity	437
National ID	CA00093	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	481
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	EAGLE ROCK	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-041	Capacity	254
National ID	CA00094	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	565-D5
Contact	Philip C. Lahr	Inundation Map Number	17 -1

Facility Name	GREEN VERDUGO	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-043	Capacity	99
National ID	CA00096	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	503-F6
Contact	Philip C. Lahr	Inundation Map Number	25 -1

Facility Name	UPPER STONE CANYON	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-044	Capacity	425
National ID	CA00097	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	561
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	YARNELL DEBRIS BASIN	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-046	Capacity	105
National ID	CA00099	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	481-E4
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	SANTA YNEZ CANYON	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-047	Capacity	356
National ID	CA00100	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	630-E1
Contact	Philip C. Lahr	Inundation Map Number	56 -1

Facility Name	L VAN NORMAN BYPASS	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-048	Capacity	240
National ID	CA00101	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	481-E6
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	L FRANKLIN NO 2	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-052	Capacity	206
National ID	CA00118	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	592
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	FAIRMONT NO 2	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-053	Capacity	493
National ID	CA00125	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	-X
Contact	Philip C. Lahr	Inundation Map Number	

Facility Name	WHITTIER RESERVOIR NO 4	Primary Contact ID	Leon Yahuda
		Secondary Contact ID	David Schickling
		Type	ERTH
CA State Dam Number	18-002	Capacity	32
National ID	CA00153	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Whittier	Thomas Guide Page	677-C4
Contact	Dan McKenna	Inundation Map Number	69 -1

Facility Name	MORRIS S JONES	Primary Contact ID	Water & Power Dispatch Center
		Secondary Contact ID	Water & Power Dispatch Center
		Type	ERTH
CA State Dam Number	19-003	Capacity	154
National ID	CA00154	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Pasadena	Thomas Guide Page	566-H2
Contact	Water & Power Dispatch Center	Inundation Map Number	39 -1

Facility Name	BIG DALTON DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	MULA
CA State Dam Number	32-000	Capacity	915
National ID	CA00187	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	540-B7
Contact	Richard Strahan	Inundation Map Number	2 -1

Facility Name	BIG SANTA ANITA DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	VARA	
CA State Dam Number	32-002	Capacity		858
National ID	CA00188	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	537-E6	
Contact	Rey Reyes	Inundation Map Number	4 -1	

Facility Name	DEVILS GATE DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	GRAV	
CA State Dam Number	32-003	Capacity		2775
National ID	CA00189	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	535-E6	
Contact	Dam Operator-Devil's Gate	Inundation Map Number	14 -1	

Facility Name	COGSWELL DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ROCK	
CA State Dam Number	32-005	Capacity		8696
National ID	CA00190	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	508-B4	
Contact	Kevin Sweeney	Inundation Map Number	13 -1	

Facility Name	BIG TUJUNGA DAM NO 1	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	VARA	
CA State Dam Number	32-006	Capacity		5750
National ID	CA00191	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	4725-C5	
Contact	Bill Gilbert	Inundation Map Number	6 -1	

Facility Name	LIVE OAK DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	GRAV
CA State Dam Number	32-007	Capacity	239
National ID	CA00192	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	571-A5
Contact	Dam Operator or call Puddingstone	Inundation Map Number	34 -1

Facility Name	PACOIMA DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	VARA
CA State Dam Number	32-008	Capacity	3777
National ID	CA00193	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	4642-F7
Contact	Joe Lindsay	Inundation Map Number	41 -2

Facility Name	PUDDINGSTONE DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-009	Capacity	16342
National ID	CA00194	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	600-B4
Contact	Jim Newton	Inundation Map Number	46 -2

Facility Name	SAN DIMAS DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	GRAV
CA State Dam Number	32-010	Capacity	1534
National ID	CA00195	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	570-F2
Contact	Gary Elrod	Inundation Map Number	54 -1

Facility Name	SAWPIT DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	CORA	
CA State Dam Number	32-012	Capacity		406
National ID	CA00196	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	537-J7	
Contact	Sam Villegas	Inundation Map Number	57 -1	

Facility Name	SIERRA MADRE DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	CORA	
CA State Dam Number	32-013	Capacity		51
National ID	CA00197	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	537-B7	
Contact	Reservoir Unit	Inundation Map Number	60 -1	

Facility Name	THOMPSON CREEK DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ERTH	
CA State Dam Number	32-015	Capacity		543
National ID	CA00198	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	571-D4	
Contact	Dam Operator or call	Inundation Map Number	64 -1	

Facility Name	PUDDINGSTONE DIVERSION DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ERTH	
CA State Dam Number	32-016	Capacity		195
National ID	CA00199	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	570-E6	
Contact	Gary Elrod	Inundation Map Number	47 -1	

Facility Name	SAN GABRIEL DAM NO 1	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERRK
CA State Dam Number	32-019	Capacity	44183
National ID	CA00200	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	539-E2
Contact	Bob Kehler	Inundation Map Number	55 -1

Facility Name	EATON WASH DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-020	Capacity	721
National ID	CA00201	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	566-F1
Contact	Dam Operator-Eaton Wash	Inundation Map Number	18 -1

Facility Name	RUBIO DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-021	Capacity	37
National ID	CA00202	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	536-B4
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	LAGUNA REG BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-022	Capacity	310
National ID	CA00203	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	635-F4
Contact	Reservoir Unit	Inundation Map Number	30 -1

Facility Name	PALOS VERDES RESERVOIR	Primary Contact ID	George Barber
		Secondary Contact ID	Christopher Hill
		Type	ERTH
CA State Dam Number	35-004	Capacity	1100
National ID	CA00215	Storage	
County	LOS ANGELES	Pct Full	
Owner	Metropolitan Water District	Thomas Guide Page	73 -C5
Contact	Eagle Rock Control Ctr	Inundation Map Number	42 -1

Facility Name	MORRIS DAM	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	GRAV
CA State Dam Number	32-040	Capacity	2700
National ID	CA00216	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	86 -F1
Contact	Art Diaz	Inundation Map Number	38 -1

Facility Name	GARVEY RESERVOIR	Primary Contact ID	George Barber
		Secondary Contact ID	Christopher Hill
		Type	ERTH
CA State Dam Number	35-006	Capacity	1610
National ID	CA00217	Storage	
County	LOS ANGELES	Pct Full	
Owner	Metropolitan Water District	Thomas Guide Page	46 -D3
Contact	N Nerdman	Inundation Map Number	22 -1

Facility Name	WEYMOUTH MEM RESERVOIR	Primary Contact ID	George Barber
		Secondary Contact ID	Christopher Hill
		Type	RECT
CA State Dam Number	35-011	Capacity	151
National ID	CA00222	Storage	
County	LOS ANGELES	Pct Full	
Owner	Metropolitan Water District	Thomas Guide Page	90 -C2
Contact	L Hines	Inundation Map Number	67 -1

Facility Name	LITTLEROCK	Primary Contact ID	Dennis LaMoreaux
		Secondary Contact ID	Jon Pernula
		Type	MULA
CA State Dam Number	57-000	Capacity	3500
National ID	CA00237	Storage	
County	LOS ANGELES	Pct Full	
Owner	Little Rock Irrigation District	Thomas Guide Page	4377-D6
Contact	Dennis LaMoreaux	Inundation Map Number	33 -1

Facility Name	HAROLD RESERVOIR	Primary Contact ID	Dennis LaMoreaux
		Secondary Contact ID	David Hasson
		Type	ERTH
CA State Dam Number	57-002	Capacity	4250
National ID	CA00238	Storage	
County	LOS ANGELES	Pct Full	
Owner	Palmdale Water District	Thomas Guide Page	4286-B5
Contact	Dennis LaMoreaux	Inundation Map Number	28 -1

Facility Name	WRIGLEY RESERVOIR	Primary Contact ID	Dean Menroe
		Secondary Contact ID	Rudy Haro
		Type	ERTH
CA State Dam Number	104-026	Capacity	62
National ID	CA00444	Storage	
County	LOS ANGELES	Pct Full	
Owner	Southern California Edison	Thomas Guide Page	5923-E2
Contact	Dean Menroe	Inundation Map Number	85 -1

Facility Name	THOMPSON	Primary Contact ID	Dean Menroe
		Secondary Contact ID	Rudy Haro
		Type	ERTH
CA State Dam Number	104-027	Capacity	1010
National ID	CA00445	Storage	
County	LOS ANGELES	Pct Full	
Owner	Southern California Edison	Thomas Guide Page	5923
Contact	Dean Menroe	Inundation Map Number	

Facility Name	MALIBOU LAKE CLUB	Primary Contact ID	Steve Sohus
		Secondary Contact ID	Chuck Kundert
		Type	CORA
CA State Dam Number	771-000	Capacity	500
National ID	CA00739	Storage	
County	LOS ANGELES	Pct Full	
Owner	Malibou Lake Management Assn.	Thomas Guide Page	588-B4
Contact	Steve Sohus	Inundation Map Number	37 -5

Facility Name	CENTURY	Primary Contact ID	Belake Steele
		Secondary Contact ID	Mike Boyd
		Type	CORA
CA State Dam Number	1-071	Capacity	70
National ID	CA00740	Storage	
County	LOS ANGELES	Pct Full	
Owner	State of California-P&R	Thomas Guide Page	588-D5
Contact	Belake Steele	Inundation Map Number	10 -4

Facility Name	PORTER ESTATE	Primary Contact ID	Anthony Barton
		Secondary Contact ID	David Hasson
		Type	ERTH
CA State Dam Number	775-000	Capacity	135
National ID	CA00741	Storage	
County	LOS ANGELES	Pct Full	
Owner	Porter Ranch Development	Thomas Guide Page	500-E3
Contact	Anthony Barton	Inundation Map Number	N/A

Facility Name	LINDERO	Primary Contact ID	Arnold Quintanilla
		Secondary Contact ID	Greg Feet
		Type	ERTH
CA State Dam Number	785-000	Capacity	90
National ID	CA00742	Storage	
County	LOS ANGELES	Pct Full	
Owner	Lake Lindero Homeowners Associ	Thomas Guide Page	587-B1
Contact	Arnold Quintanilla	Inundation Map Number	N/A

Facility Name	POTRERO	Primary Contact ID	Lenny Targon
		Secondary Contact ID	William Foreman
		Type	GRAV
CA State Dam Number	786-000	Capacity	791
National ID	CA00743	Storage	
County	LOS ANGELES	Pct Full	
Owner	Westlake Management District	Thomas Guide Page	587-B1
Contact	Lenny Targon	Inundation Map Number	45 -4

Facility Name	RIVIERA RESERVOIR	Primary Contact ID	Bob Harvey
		Secondary Contact ID	
		Type	RECT
CA State Dam Number	1043-000	Capacity	76
National ID	CA00876	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Santa Monica	Thomas Guide Page	631-E3
Contact	Bob Harvey	Inundation Map Number	52 -3

Facility Name	10 MG WALTERIA	Primary Contact ID	Alan Berndt
		Secondary Contact ID	Jack Van der Linden
		Type	RECT
CA State Dam Number	1049-000	Capacity	31
National ID	CA00881	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Torrance	Thomas Guide Page	763-E5
Contact	Alan Berndt	Inundation Map Number	N/A

Facility Name	GREYSTONE RESERVOIR	Primary Contact ID	Ed Otsuka
		Secondary Contact ID	Jin Trulan
		Type	RECT
CA State Dam Number	1061-000	Capacity	60
National ID	CA00893	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Beverly Hills	Thomas Guide Page	592-F5
Contact	Marcel Garubba	Inundation Map Number	27 -1

Facility Name	WESTLAKE RESERVOIR	Primary Contact ID	Roger Huff
		Secondary Contact ID	John Mundy
		Type	ERTH
CA State Dam Number	1073-000	Capacity	9800
National ID	CA00904	Storage	
County	LOS ANGELES	Pct Full	
Owner	Las Virgenes MWD	Thomas Guide Page	587-B1
Contact	Roger Huff	Inundation Map Number	66 -7

Facility Name	CHEVY CHASE 1290	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	ERTH
CA State Dam Number	5-008	Capacity	17
National ID	CA01078	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	565
Contact	Dennis Maxwell	Inundation Map Number	

Facility Name	EAST GLORIETTA	Primary Contact ID	Martin Nixt
		Secondary Contact ID	Donald R. Froelich
		Type	RECT
CA State Dam Number	5-009	Capacity	71
National ID	CA01079	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Glendale	Thomas Guide Page	534-H6
Contact	Dennis Maxwell	Inundation Map Number	24 -1

Facility Name	ELDERBERRY FOREBAY	Primary Contact ID	Larry Gillis
		Secondary Contact ID	George Brodt
		Type	ERTH
CA State Dam Number	6-049	Capacity	28400
National ID	CA01080	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	436-9
Contact	Bill Spring	Inundation Map Number	

Facility Name	LOS ANGELES RESERVOIR	Primary Contact ID	Philip C. Lahr
		Secondary Contact ID	LAWS-DAC Control Room
		Type	ERTH
CA State Dam Number	6-050	Capacity	10000
National ID	CA01081	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Los Angeles	Thomas Guide Page	481-F5
Contact	Philip C. Lahr	Inundation Map Number	80 -1

Facility Name	LIVE OAK RESERVOIR	Primary Contact ID	George Barber
		Secondary Contact ID	Christopher Hill
		Type	ERTH
CA State Dam Number	35-013	Capacity	2500
National ID	CA01084	Storage	
County	LOS ANGELES	Pct Full	
Owner	Metropolitan Water District	Thomas Guide Page	95A-E5
Contact	G Del Toro	Inundation Map Number	84 -1

Facility Name	BAILEY DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-024	Capacity	43
National ID	CA01150	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	566-J1
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	BLANCHARD DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-025	Capacity	26
National ID	CA01151	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	535-C2
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	BRAND DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-026	Capacity	42
National ID	CA01152	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	534-B6
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	LA TUNA DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-027	Capacity	207
National ID	CA01153	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	503-E6
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	LITTLE DALTON DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-028	Capacity	234
National ID	CA01154	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	569-H2
Contact	Richard Strahan	Inundation Map Number	32 -1

Facility Name	SANTA ANITA DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-029	Capacity	116
National ID	CA01155	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	567-E1
Contact	Rey Reyes	Inundation Map Number	5 -1

Facility Name	BIG DALTON DEBRIS BASIN	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ERTH	
CA State Dam Number	32-030	Capacity		193
National ID	CA01156	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	569-H2	
Contact	Richard Strahan	Inundation Map Number	3 -1	

Facility Name	SAWPIT DEBRIS BASIN	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ERTH	
CA State Dam Number	32-031	Capacity		152
National ID	CA01157	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	567-H1	
Contact	Sam Villegas	Inundation Map Number	58 -1	

Facility Name	SIERRA MADRE VILLA DAM	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ERTH	
CA State Dam Number	32-032	Capacity		109
National ID	CA01158	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	566-G1	
Contact	Reservoir Unit	Inundation Map Number	N/A	

Facility Name	STOUGH DEBRIS BASIN	Primary Contact ID	Reservoir Unit	
		Secondary Contact ID		
		Type	ERTH	
CA State Dam Number	32-033	Capacity		67
National ID	CA01160	Storage		
County	LOS ANGELES	Pct Full		
Owner	Los Angeles County	Thomas Guide Page	533-H4	
Contact	Reservoir Unit	Inundation Map Number	N/A	

Facility Name	LOWER SUNSET DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-034	Capacity	37
National ID	CA01161	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	533-J5
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	WILSON DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-035	Capacity	84
National ID	CA01162	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	482-A1
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	SCHOOLHOUSE DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-036	Capacity	19
National ID	CA01172	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	481-H1
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	18 MG WALTERIA	Primary Contact ID	Alan Berndt
		Secondary Contact ID	Jack Van der Linden
		Type	RECT
CA State Dam Number	1049-002	Capacity	58
National ID	CA01193	Storage	
County	LOS ANGELES	Pct Full	
Owner	City of Torrance	Thomas Guide Page	763-E5
Contact	Alan Berndt	Inundation Map Number	N/A

Facility Name	MORGAN DEBRIS BASIN	Primary Contact ID	Reservoir Unit
		Secondary Contact ID	
		Type	ERTH
CA State Dam Number	32-039	Capacity	21
National ID	CA01385	Storage	
County	LOS ANGELES	Pct Full	
Owner	Los Angeles County	Thomas Guide Page	570-A4
Contact	Reservoir Unit	Inundation Map Number	N/A

Facility Name	HAINES CANYON DEBRIS BASIN	Primary Contact ID	Brian Tracy
		Secondary Contact ID	Greg Peacock
		Type	ERTH
CA State Dam Number	9000-004	Capacity	92
National ID	CA10004	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Army Corps of Engineers	Thomas Guide Page	504-B3
Contact	Terry Wotherspoon	Inundation Map Number	

Facility Name	HANSEN DAM	Primary Contact ID	Brian Tracy
		Secondary Contact ID	Greg Peacock
		Type	ERTH
CA State Dam Number	9000-019	Capacity	26695
National ID	CA10019	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Army Corps of Engineers	Thomas Guide Page	502-H3
Contact	Greg Peacock	Inundation Map Number	73 -10

Facility Name	LOPEZ	Primary Contact ID	Brian Tracy
		Secondary Contact ID	Greg Peacock
		Type	ERTH
CA State Dam Number	9000-020	Capacity	441
National ID	CA10020	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Army Corps of Engineers	Thomas Guide Page	482-E4
Contact	Greg Peacock	Inundation Map Number	36 -3

Facility Name	SANTA FE DAM	Primary Contact ID	Brian Tracy
		Secondary Contact ID	Greg Peacock
		Type	ERTH
CA State Dam Number	9000-024	Capacity	32109
National ID	CA10024	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Army Corps of Engineers	Thomas Guide Page	598-B2
Contact	Greg Peacock	Inundation Map Number	77 -4

Facility Name	SEPULVEDA DAM	Primary Contact ID	Brian Tracy
		Secondary Contact ID	Greg Peacock
		Type	ERTH
CA State Dam Number	9000-025	Capacity	17425
National ID	CA10025	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Army Corps of Engineers	Thomas Guide Page	561-G2
Contact	Greg Peacock	Inundation Map Number	78 -8

Facility Name	WHITTIER NARROWS DAM	Primary Contact ID	Brian Tracy
		Secondary Contact ID	Greg Peacock
		Type	ERTH
CA State Dam Number	9000-027	Capacity	36160
National ID	CA10027	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Army Corps of Engineers	Thomas Guide Page	636-H7
Contact	Greg Peacock	Inundation Map Number	79 -6

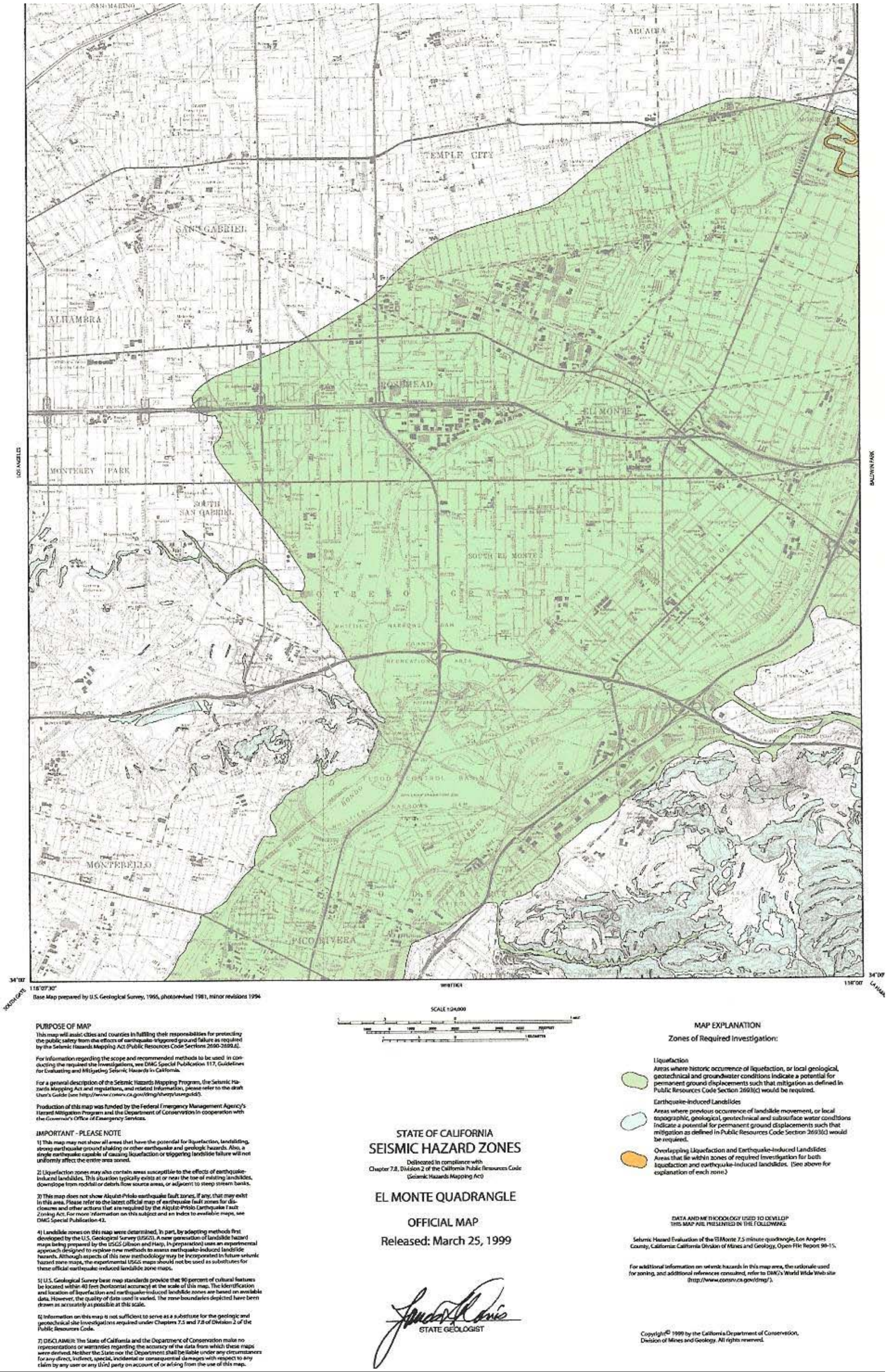
Facility Name	REC DAM EDWARDS AF BASE	Primary Contact ID	David Bookrum
		Secondary Contact ID	David Bookrum
		Type	ERTH
CA State Dam Number	9000-120	Capacity	17
National ID	CA10120	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Airforce	Thomas Guide Page	
Contact	Contact Disaster Standby Personnel	Inundation Map Number	

Facility Name	BROWN MOUNTAIN BARRIER	Primary Contact ID	Gwendolyn Harris Nishida
		Secondary Contact ID	David Kerr
		Type	GRAV
CA State Dam Number	9000-341	Capacity	600
National ID	CA82421	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Forest Service	Thomas Guide Page	-M
Contact	Richard McCombs	Inundation Map Number	

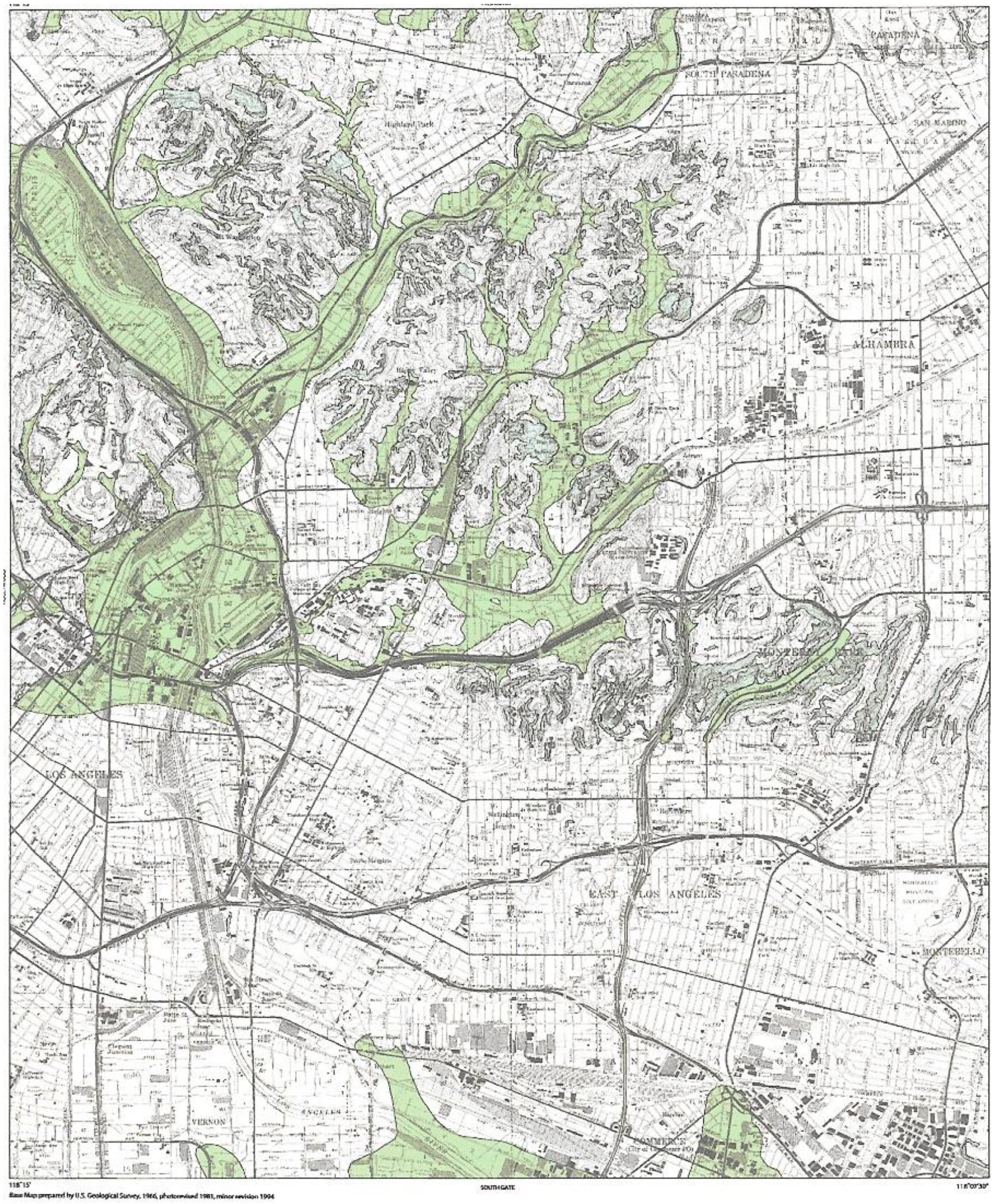
Facility Name	PICKENS M1	Primary Contact ID	Gwendolyn Harris Nishida
		Secondary Contact ID	David Kerr
		Type	GRAV
CA State Dam Number	9000-340	Capacity	16
National ID	CA82427	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Forest Service	Thomas Guide Page	-M
Contact	Richard McCombs	Inundation Map Number	

Facility Name	BLANCHARD M1	Primary Contact ID	Gwendolyn Harris Nishida
		Secondary Contact ID	David Kerr
		Type	GRAV
CA State Dam Number	9000-342	Capacity	24
National ID	CA82438	Storage	
County	LOS ANGELES	Pct Full	
Owner	U.S. Forest Service	Thomas Guide Page	-M
Contact	Richard McCombs	Inundation Map Number	

Seismic Hazards Map (El Monte Quadrangle)



Seismic Hazards Map (Los Angeles Quadrangle)



118°15'
Base Map prepared by U.S. Geological Survey, 1966, photorevised 1981, minor revision 1994

SOUTH GATE

118°07'30"

SCALE 1:24,000

PURPOSE OF MAP

This map will assist cities and counties in fulfilling their responsibilities for protecting the public safety from the effects of earthquake triggered ground failure as required by the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6).

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

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

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

IMPORTANT - PLEASE NOTE

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

2) Liquefaction zones may also contain areas susceptible to the effects of earthquake-induced landslides. This situation typically exists at or near the toe of existing landslides, downslope from rockfall or debris flow source areas, or adjacent to steep stream banks.

3) This map does not show Alquist-Priolo earthquake fault zones, if any, that may exist in this area. Please refer to the latest official map of earthquake fault zones for disclosures and other actions that are required by the Alquist-Priolo Earthquake Fault Zoning Act. For more information on this subject and an index to available maps, see DMG Special Publication 42.

4) Landslide zones on this map were determined, in part, by adapting methods first developed by the U.S. Geological Survey (USGS). A new generation of landslide hazard maps being prepared by the USGS (Jibson and Harp, in preparation) uses an experimental approach designed to explore new methods to assess earthquake-induced landslide hazards. Although aspects of this new methodology may be incorporated in future seismic hazard zone maps, the experimental USGS maps should not be used as substitutes for these official earthquake-induced landslide zone maps.

5) U.S. Geological Survey base map standards provide that 90 percent of cultural features be located within 40 feet (horizontal accuracy) at the scale of this map. The identification and location of liquefaction and earthquake-induced landslide zones are based on available data. However, the quality of data used is varied. The zone boundaries depicted have been drawn as accurately as possible at this scale.

6) Information on this map is not sufficient to serve as a substitute for the geologic and geotechnical site investigations required under Chapters 7.5 and 7.8 of Division 2 of the Public Resources Code.

7) DISCLAIMER: The State of California and the Department of Conservation make no representations or warranties regarding the accuracy of the data from which these maps were derived. Neither the State nor the Department shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

STATE OF CALIFORNIA
SEISMIC HAZARD ZONES

Delineated in compliance with
Chapter 7.8, Division 2 of the California Public Resources Code
(Seismic Hazards Mapping Act)

LOS ANGELES QUADRANGLE

OFFICIAL MAP
Released: March 25, 1999

STATE GEOLOGIST

MAP EXPLANATION

Zones of Required Investigation:

Liquefaction
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

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

DATA AND METHODOLOGY USED TO DEVELOP THIS MAP ARE PRESENTED IN THE FOLLOWING:

Seismic Hazard Evaluation of the Los Angeles 7.5 minute quadrangle, Los Angeles County, California: California Division of Mines and Geology, Open-File Report 98-20.

For additional information on seismic hazards in this map area, the rationale used for zoning, and additional references consulted, refer to DMG's World Wide Web site (http://www.consrv.ca.gov/dmg/).

Peak Ground Acceleration – Firm Rock Conditions (El Monte Quadrangle)

2003

SEISMIC HAZARD EVALUATION OF THE EL MONTE QUADRANGLE

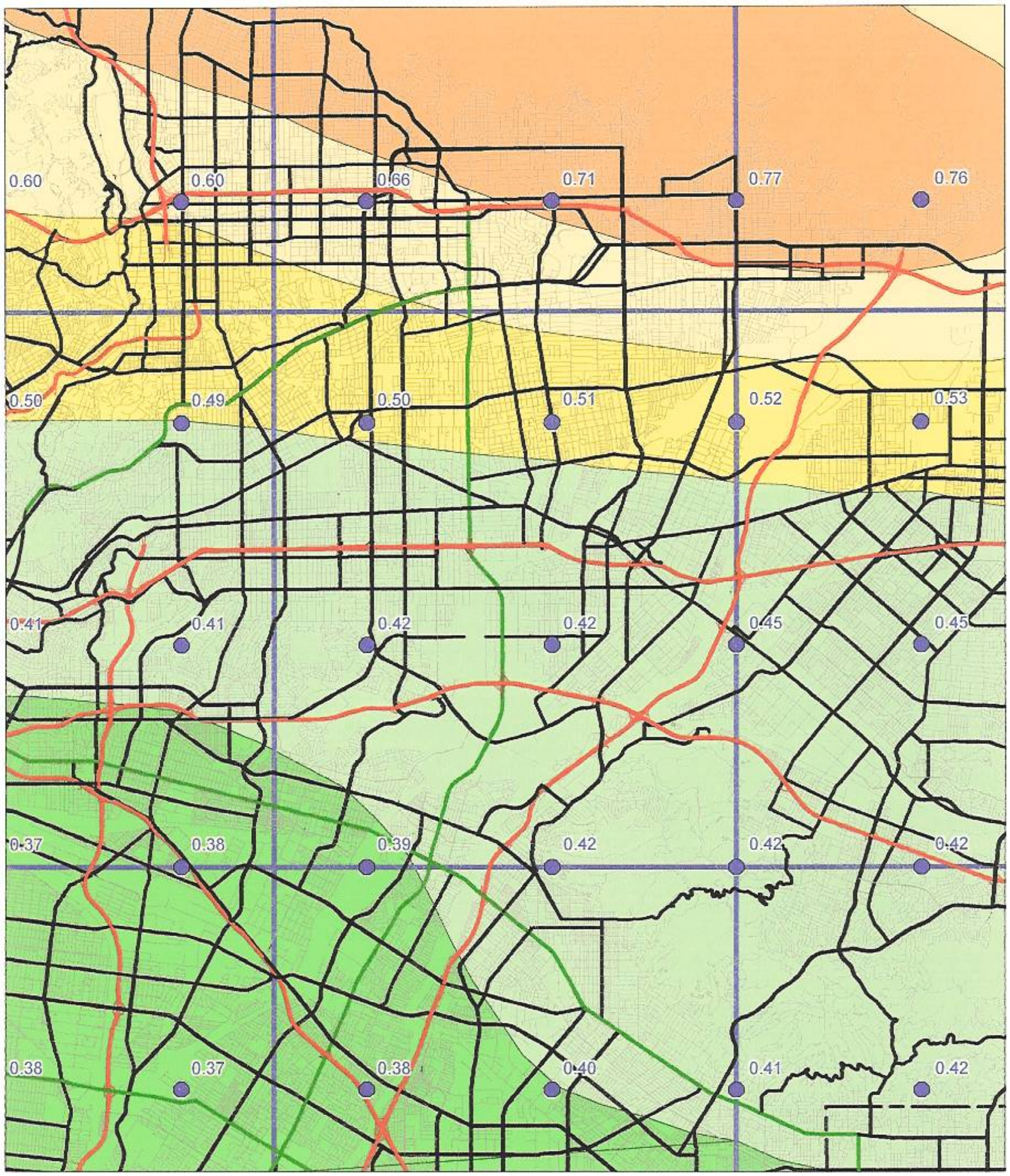
31

EL MONTE 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

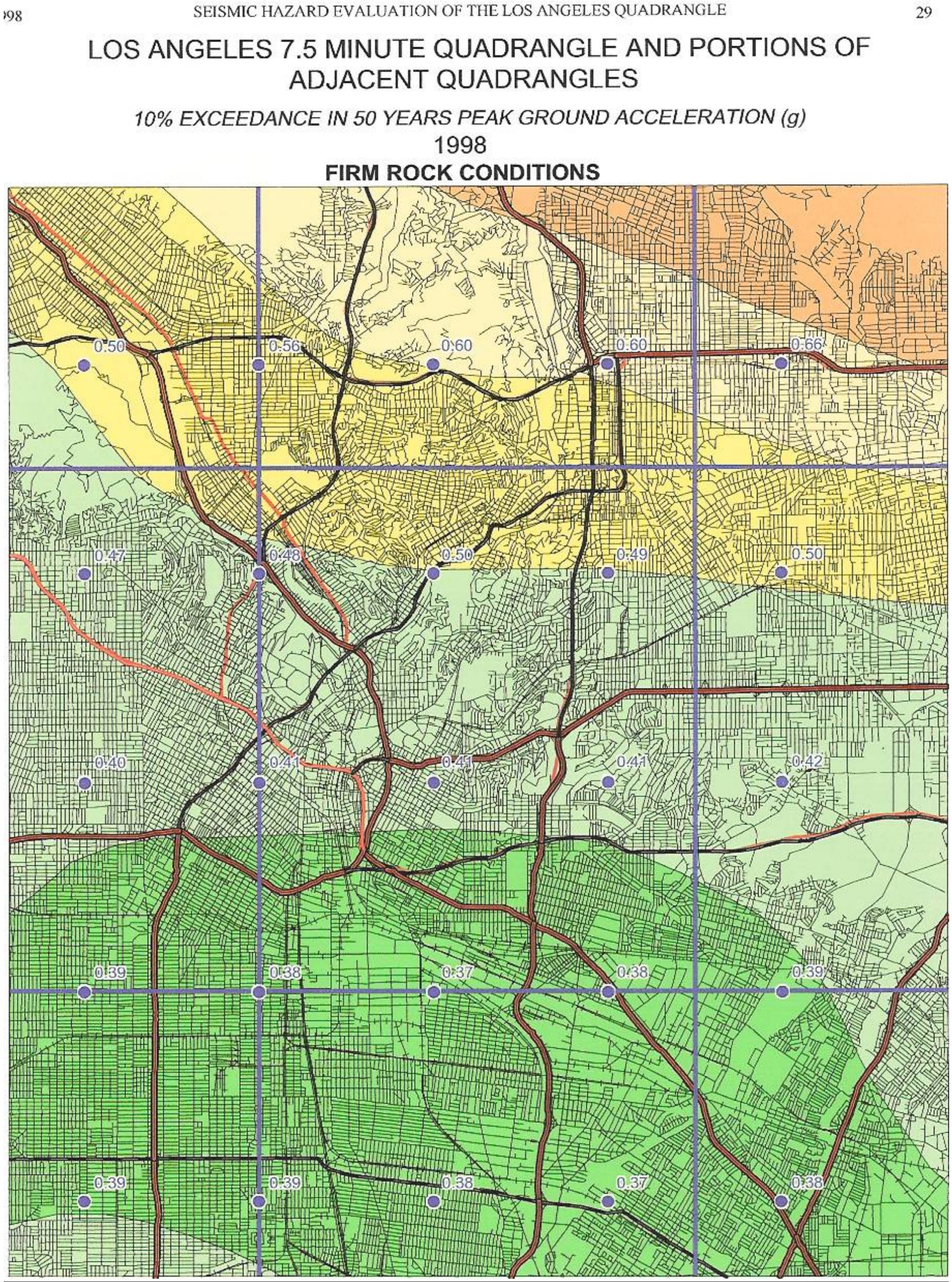
10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

FIRM ROCK CONDITIONS



Peak Ground Acceleration – Firm Rock Conditions (Los Angeles Quadrangle)



Peak Ground Acceleration – Soft Rock Conditions (El Monte Quadrangle)

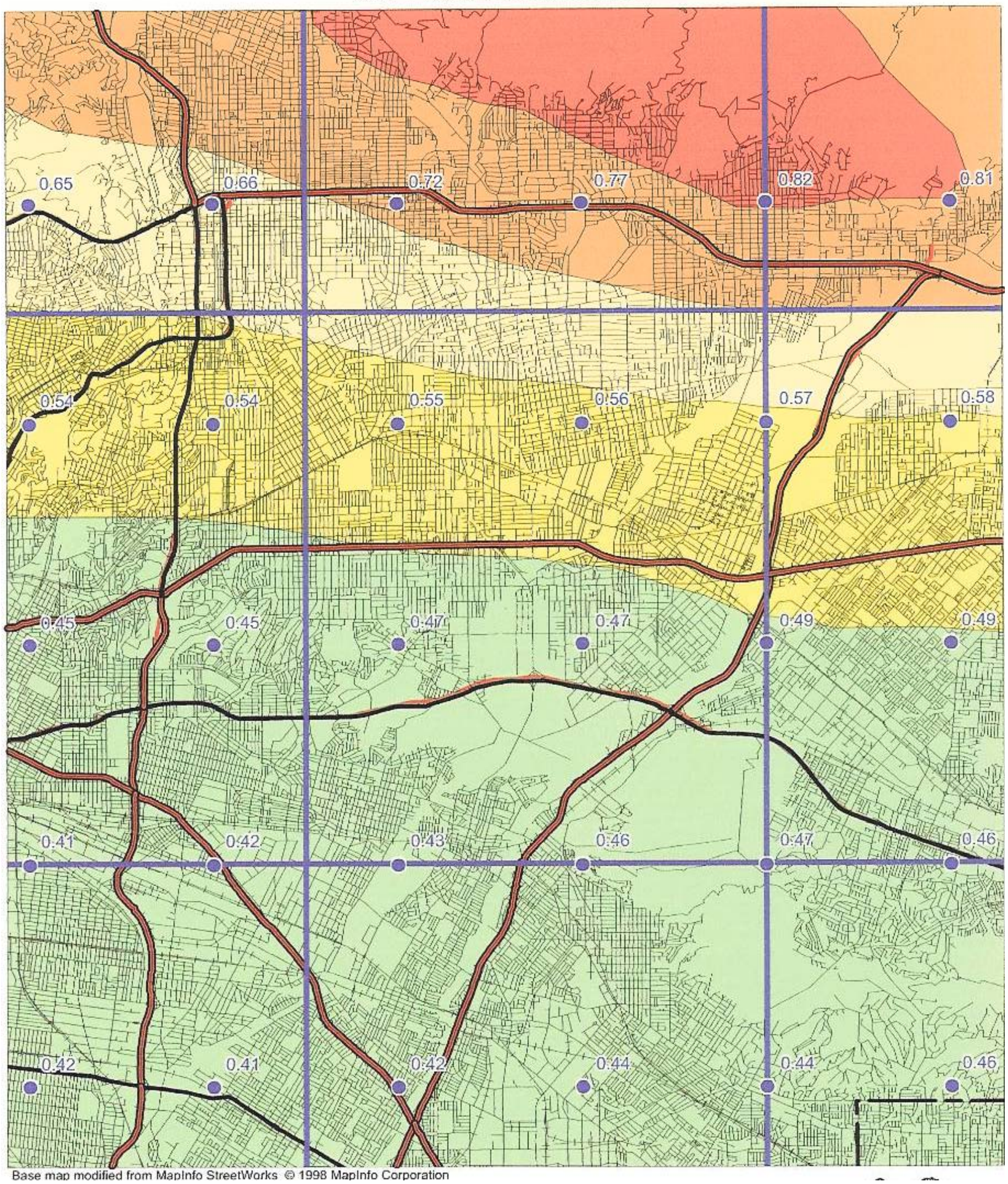
32 DIVISION OF MINES AND GEOLOGY OFR 98-15

EL MONTE 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

SOFT ROCK CONDITIONS



Base map modified from MapInfo StreetWorks © 1998 MapInfo Corporation

Peak Ground Acceleration – Soft Rock Conditions (Los Angeles Quadrangle)

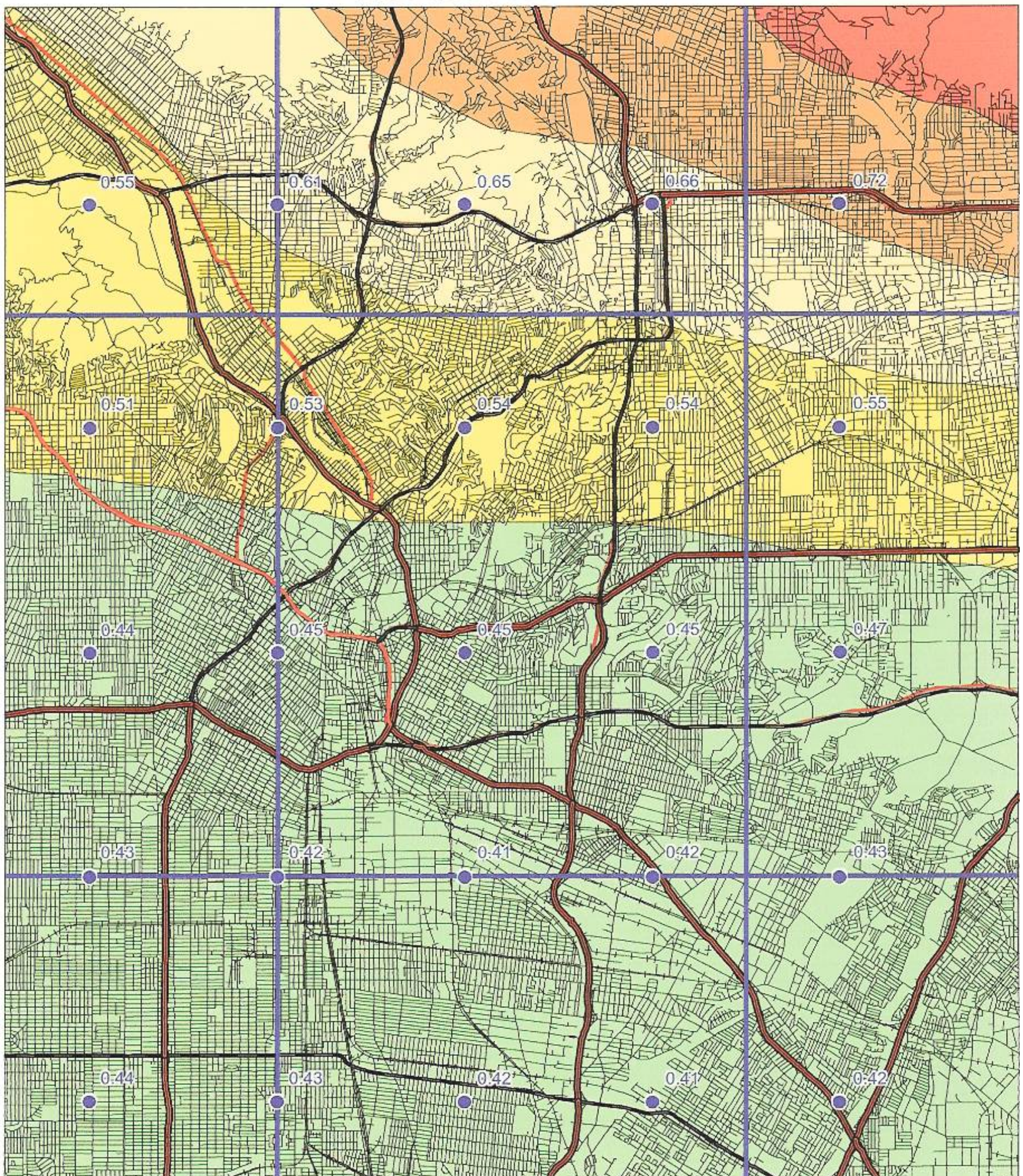
30 DIVISION OF MINES AND GEOLOGY OFR 98-20

LOS ANGELES 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

SOFT ROCK CONDITIONS



Base map modified from MapInfo StreetWorks. © 1998 MapInfo Corporation

Peak Ground Acceleration – Alluvium Conditions (El Monte Quadrangle)

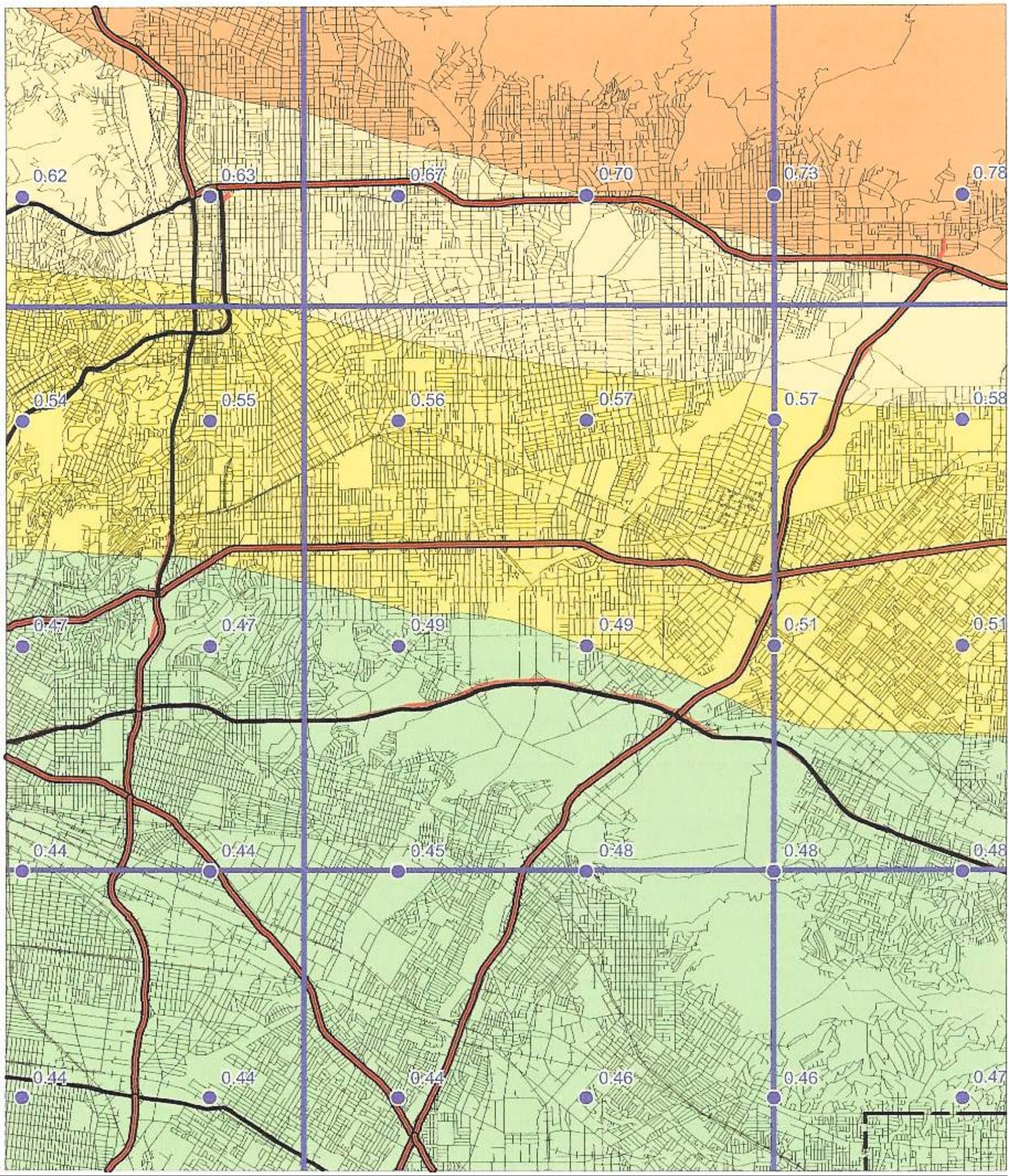
1998 SEISMIC HAZARD EVALUATION OF THE EL MONTE QUADRANGLE 33

EL MONTE 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

ALLUVIUM CONDITIONS



Peak Ground Acceleration – Alluvium Conditions (Los Angeles Quadrangle)

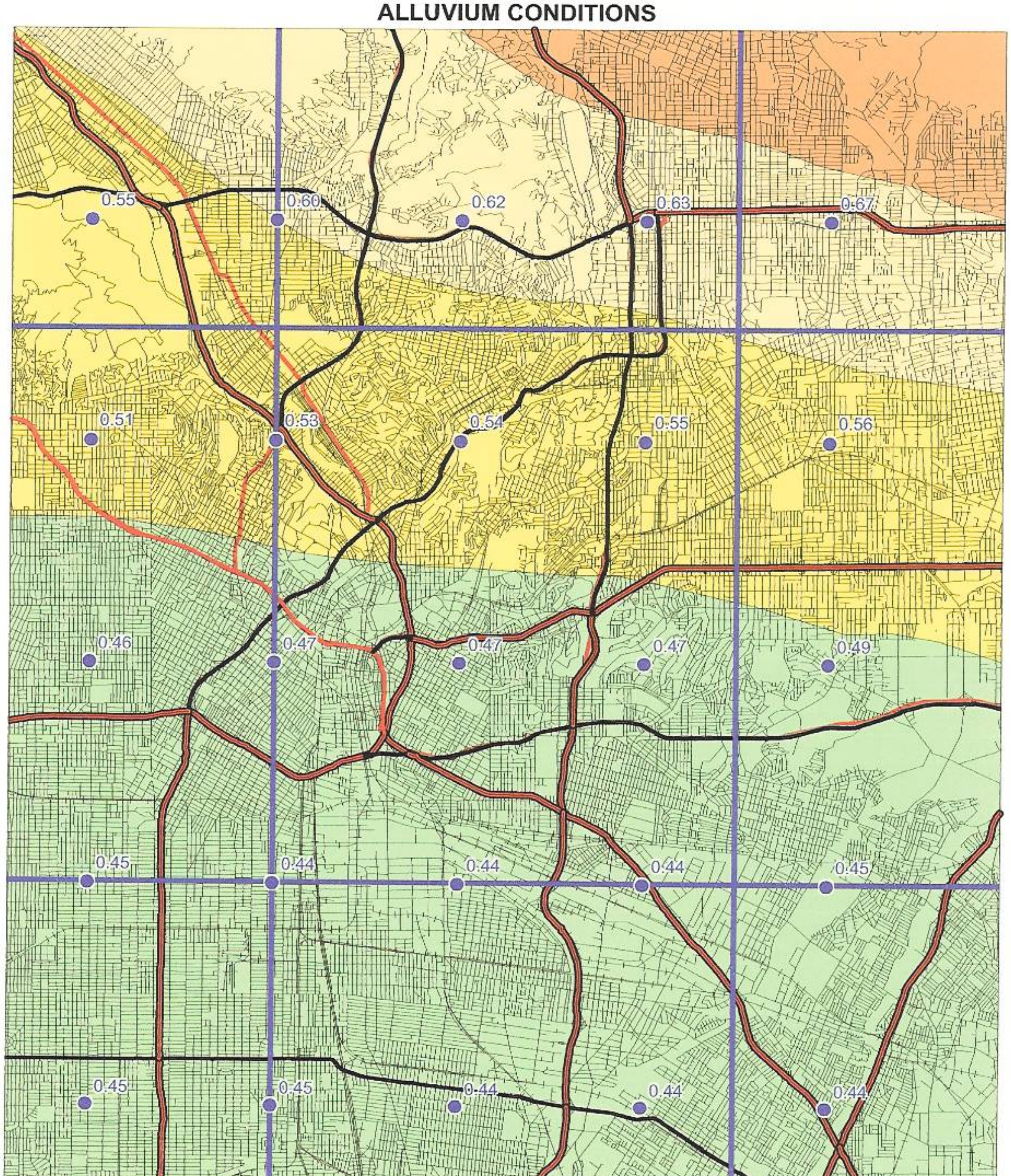
1998 SEISMIC HAZARD EVALUATION OF THE LOS ANGELES QUADRANGLE 31

LOS ANGELES 7.5 MINUTE QUADRANGLE AND PORTIONS OF ADJACENT QUADRANGLES

10% EXCEEDANCE IN 50 YEARS PEAK GROUND ACCELERATION (g)

1998

ALLUVIUM CONDITIONS



Base map modified from MapInfo Street Works ©1998 MapInfo Corporation

Critical Facilities

TYPE	NAME	LOCATION
Government	City Hall	320 W. Newmark Avenue
Government	Library	318 S. Ramona Avenue
Government	Fire Station #1 (Headquarters)	350 W. Newmark Avenue
Government	Fire Station #2	2001 S. Garfield
Government	Fire Station #3	704 Monterey Pass Raod
Government	Police Station	320 W. Newmank Avenue
Hospital	Garfield Medical Center	525 N. Garfield Avenue
Hospital	Monterey Park Hospital	900 S. Atlantic Blvd.
Public School	East Los Angeles Community Day	1260 S. Monterey Pass Road
Public School	Macy Intermediate	2101 S. Lupine Avenue
Public School	Ynez Elementary	120 S. Ynez Avenue
Public School	Monterey Highlands Elementary	400 Casuda Canyon Drive
Public School	Bella Vista Elementary	2410 Findlay Avenue
Public School	Brightwood Elementary	1701 Brightwood Street
Public School	Repetto Elementary	650 Grandridge Avenue
Public School	Hillcrest Elementary	795 Pepper Street
Public School	Monterey Vista Elementary	901 E. Graves Avenue
Public School	Lane Elementary	Cesar Chavez Avenue
Private School	Belmont College Preparatory	1260 S. Monterey Pass Road
Private School	New Avenue School	119 S. Ramona Avenue
Private School	St. Thomas Aquinas Elementary	1501 S. Atlantic Blvd.
Private School	Meher Montessori	2009 S. Garfield Avenue
Private School	Alpha Shen Preschool	618 N. Moore
Private School	Monterey Park United Methodist	333 S. Garfield
Public College	East Los Angeles College	1301 Cesar Chavez

References

Brabb, E.E., and B.L. Harrod. (Eds) *Landslides: Extent and Economic significance. Proceedings of the 28th International Geological Congress Symposium on Landslides*. (1989). Washington D.C.

Burby, R. (Ed.). Co*operating With Nature*: *Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. (1998). Washington D.C.: Joseph Henry Press.

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Interagency Hazard Mitigation Team, *State Hazard Mitigation Plan*. (2000). Oregon Emergency Management.

Mileti, Dennis, Disasters by Design: *A Reassessment of Natural Hazards in the United States* (1999). Joseph Henry Press, Washington D.C.

Planning for Natural Hazards: *The Oregon technical Resource Guide*. (2000). Department of Land Conservation and Development, Chapter 5.

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http://www.eqe.com

http://www.esri.com

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http://www.fire.ca.gov

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http://lacofd.org

http://www.lalc.k12.ca.us

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http://pubs.usgs.gov

http://www.seismic.ca.gov

http://www.usc.edu/isd/archives

http://www.usgs.gov

http://www.sce.com

Notice of Exemption

From: City of Monterey Park Planning
320 W. Newmark Avenue
Monterey Park, CA 91754

To:

☐ Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

☑ Los Angeles, County Clerk
Environmental Filings
12400 E. Imperial Hwy. #1101
Norwalk, CA 90650
Attn: Michelle McKay

ORIGINAL FILED

OCT 19 2004

LOS ANGELES, COUNTY CLERK

Project Title: NATURAL HAZARDS MITIGATION PLAN
Project Location - Specific: Citywide
Project Location - City: Monterey Park
Project Location - County: Los Angeles

Description of Project:
Preparation of a Natural Hazards Mitigation Plan, pursuant to the Federal Emergency Management Agency (FEMA)

Name of Public Agency Approving Project: City of Monterey Park
Name of Person or Agency Carrying Out Project: City of Monterey Park

Exempt Status: (*check one*)

☐ Ministerial (Sec. 21080(b)(1); 15268);

☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));

☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));

☑ Categorical Exemption. State type and section number: Class 8

☐ Statutory Exemptions. State code number:

RECEIVED
OCT 21 2004
CITY OF MONTEREY PARK
COMMUNITY DEVELOPMENT DEPT.

Reasons why project is exempt:
The project has been determined to be a Class 8 Categorical Exemption pursuant to the California Environmental Quality Act of 1970, as amended. This is for preparation of a Natural Hazards Mitigation Plan, which involves actions of the local regulatory agency to protect the environment.

Lead Agency Contact Person: Ray Hamada Telephone (626) 307-1315

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a notice of exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: Ray Hamada Date: October 7, 2004 Title: Planning Manager

☑ Signed by Lead Agency Date received for filing at OPR:

☐ Signed by Applicant

CITY OF MONTEREY PARK

320 West Newmark Avenue • Monterey Park • California 91754-2896
www.ci.monterey-park.ca.us

City Council
Betty Tom Chu
Mike Eng
David T. Lau
Sharon Martinez
Benjamin "Frank" Venti

City Clerk
David Barron

City Treasurer
Mitchell Ing

ACTION MINUTES
MONTEREY PARK CITY COUNCIL
REGULAR MEETING
OCTOBER 6, 2004

This is to certify at its meeting of October 6, 2004, the City Council of Monterey Park approved by Minute Motion the following action:

ADOPT RESOLUTION NO. 10920

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MONTEREY PARK APPROVING A NATURAL HAZARD MITIGATION PLAN

Upon a motion by Council Member Martinez and seconded by Mayor Pro Tem Venti, the motion was approved by the following vote:

AYES:	COUNCIL MEMBERS: Martinez, Lau, Chu, Venti, Eng
NOES:	COUNCIL MEMBERS: None
ABSENT:	COUNCIL MEMBERS: None
ABSTAIN:	COUNCIL MEMBERS: None

Certified by:

David M. Barron

David M. Barron, City Clerk of the
City of Monterey Park, California

RESOLUTION NO. 10920

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MONTEREY PARK APPROVING A NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000 provides for the Federal Emergency Management Agency ("FEMA") to monitor compliance of the said law; and

WHEREAS, FEMA requires all State and local governments to prepare a five-year Natural Hazard Mitigation Plan ("Plan"); and

WHEREAS, Federal Law requires submittal to FEMA of this Plan by November 1st prior to each five-year cycle; and

WHEREAS, the City Council held a noticed public meeting on October 6, 2004.

NOW, THEREFORE, THE CITY COUNCIL FOR THE CITY OF MONTEREY PARK, DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The City Council of the City of Monterey Park does hereby approve the Natural Hazards Mitigation Plan, and finds that the City of Monterey Park has taken all of the following actions, and that the City is in conformance with all applicable requirements of FEMA.

The City of Monterey Park has locally adopted and continues to follow guidelines and satisfy goals set forth in the Safety and Community Services Element of the City's General Plan.

The City of Monterey Park has sought and received public input through media options, including the City's "Cascade" newspaper, cable television, the City's Website, and public meetings.

The City of Monterey Park has prepared a Natural Hazards Mitigation Plan that identifies and assesses potential natural hazards and outlines goals and strategies to avert them.

SECTION 2. That the City Clerk shall certify to the adoption of this Resolution and shall forward a copy hereof to the appropriate governmental agencies.

RESOLUTION NO. 10920

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MONTEREY PARK APPROVING A NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000 provides for the Federal Emergency Management Agency ("FEMA") to monitor compliance of the said law; and

WHEREAS, FEMA requires all State and local governments to prepare a five-year Natural Hazard Mitigation Plan ("Plan"); and

WHEREAS, Federal Law requires submittal to FEMA of this Plan by November 1st prior to each five-year cycle; and

WHEREAS, the City Council held a noticed public meeting on October 6, 2004.

NOW, THEREFORE, THE CITY COUNCIL FOR THE CITY OF MONTEREY PARK, DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The City Council of the City of Monterey Park does hereby approve the Natural Hazards Mitigation Plan, and finds that the City of Monterey Park has taken all of the following actions, and that the City is in conformance with all applicable requirements of FEMA.

The City of Monterey Park has locally adopted and continues to follow guidelines and satisfy goals set forth in the Safety and Community Services Element of the City's General Plan.

The City of Monterey Park has sought and received public input through media options, including the City's "Cascade" newspaper, cable television, the City's Website, and public meetings.

The City of Monterey Park has prepared a Natural Hazards Mitigation Plan that identifies and assesses potential natural hazards and outlines goals and strategies to avert them.

SECTION 2. That the City Clerk shall certify to the adoption of this Resolution and shall forward a copy hereof to the appropriate governmental agencies

Commissioner Garcia — He noted that the parking lot lighting from the market area lights up the entire back section.

PUBLIC HEARING CLOSED: Chair Amador closed the public portion of the meeting.

MOTION: On motion by Commissioner Chan, seconded by Commissioner Lee to ADOPT Resolution approving Conditional Use Permit, with conditions and amendments, and for the reasons contained therein. The motion was voted on as follows:

VOTE:

AYES:	Chair Amador, Commissioners Garcia, Hamner, Chan and Lee
NOES:	None
ABSTAIN:	None
ABSENT:	None

NEW BUSINESS:

6. NATURAL HAZARDS MITIGATION PLAN

The City is developing a Natural Hazards Mitigation Plan to comply with Federal Emergency Management Agency (FEMA) requirements.

Planning Manager Hamada — He stated that FEMA requires that every city develop this plan. One condition is that it be resolved by November 1, 2004. California is subject to natural disasters. Staff has narrowed types of disasters that this plan will evaluate. This plan will set forth goals to mitigate any potential hazards. The Federal Government would rather spend the money on prevention and planning to minimize results of the disaster. Public participation is a key component. Staff has been working with consultant, Carl Heinz as well as the assistance of the Public Works Department and Fire Department.

PUBLIC HEARING OPENED: Chair Amador opened the public portion of the meeting.

No speakers were present.

PUBLIC HEARING CLOSED:	Chair Amador closed the public portion of the meeting.
Commissioner Chan	He asked how this plan will be implemented.
Planning Manager Hamada	He stated that once the plan is adopted it sets forth some goals. Strategies will be implemented and a Steering Committee will be created. He noted that this plan must be adopted every five years. Any needs will be processed.
Commissioner Chan	He clarified that this is a set of goals and objectives.
Planning Manager Hamada	He stated that it is somewhat of a general plan that focuses on natural hazards.
Commissioner Chan	He asked if there is funding to carry out any of these functions.
Planning Manager Hamada	Staff time will be diverted towards working on this plan.
Commissioner Chan	He stated that FEMA may offer funding.
Planning Manager Hamada	He stated that they will constantly be in touch with FEMA.
MOTION:	On motion by Commissioner Lee, seconded by Commissioner Garcia to ADOPT Resolution recommending the Plan to City Council. The motion was voted on as follows:

VOTE:

AYES:	Chair Amador, Commissioners Garcia, Hamner, Chan and Lee
NOES:	None
ABSTAIN:	None
ABSENT:	None

1. **CONTINUED – PRECISE PLAN/MODIFICATION TO SPECIFIC PLAN/TENTATIVE TRACT MAP NO. 061864 – 424-624 N. ATLANTIC BOULEVARD (PP-04-03/MSP-04-02/TM-04-06)**

Applicant, Kam Sang Company, Inc., for Atlantic Time Square LLC, has requested a Precise Plan, pursuant to Chapter 21.34 of the MPMC, to redevelop and

RESOLUTION NO. 30-04

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MONTEREY PARK RECOMMENDING APPROVAL OF A NATURAL HAZARD MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000 provides for the Federal Emergency Management Agency ("FEMA") to monitor compliance of the said law; and

WHEREAS, FEMA requires all State and local governments to prepare a five-year Natural Hazard Mitigation Plan ("Plan"); and

WHEREAS, Federal Law requires submittal to FEMA of this Plan by November 1st prior to each five-year cycle; and

WHEREAS, the Planning Commission held a noticed public meeting on September 28, 2004.

NOW, THEREFORE, THE PLANNING COMMISSION FOR THE CITY OF MONTEREY PARK, DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. That the City of Monterey Park has taken all of the following actions, and that the City is in conformance with all applicable requirements of FEMA.

The City of Monterey Park has locally adopted and continues to follow guidelines and satisfy goals set forth in the Safety and Community Services Element of the City's General Plan.

The City of Monterey Park has sought and received public input through media options, including the City's "Cascade" newspaper, cable television, the City's Website, and public meetings.

The City of Monterey Park has prepared a Natural Hazards Mitigation Plan that identifies and assesses potential natural hazards and outlines goals and strategies to avert them.

SECTION 2. The Secretary shall certify to the adoption of this Resolution and shall forward a copy hereof to the City Council.

APPROVED AND ADOPTED this 28th day of September, 2004.

Chairperson Amador

I hereby certify that the foregoing Resolution was duly adopted by the Planning Commission of the City of Monterey Park at a regular meeting held on the 28th day of September, 2004, by the following vote:

AYES:	Chairperson Amador, Commissioners Garcia, Hamner, Chan and Lee
NOES:	None
ABSENT:	None
ABSTAIN:	None

Adolfo C. Reta, Secretary

CITY OF MONTEREY PARK

320 West Newmark Avenue • Monterey Park • California 91754-2896
www.ci.monterey-park.ca.us

ACTION MINUTES
MONTEREY PARK CITY COUNCIL
REGULAR MEETING
September 3, 2008

This is to certify at its meeting of September 3, 2008, the City Council of Monterey Park approved by Minute Motion the following action:

LOCAL HAZARD MITIGATION PLAN

The Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2000 has required all state, local and tribal governments to submit a five-year Local Hazard Mitigation Plan, formerly known as a Natural Hazard Mitigation Plan. Council adopted this plan on October 6, 2004. This update of the plan will include the addition of man-made disasters, a required detailed Drought Plan and updated earthquake information.

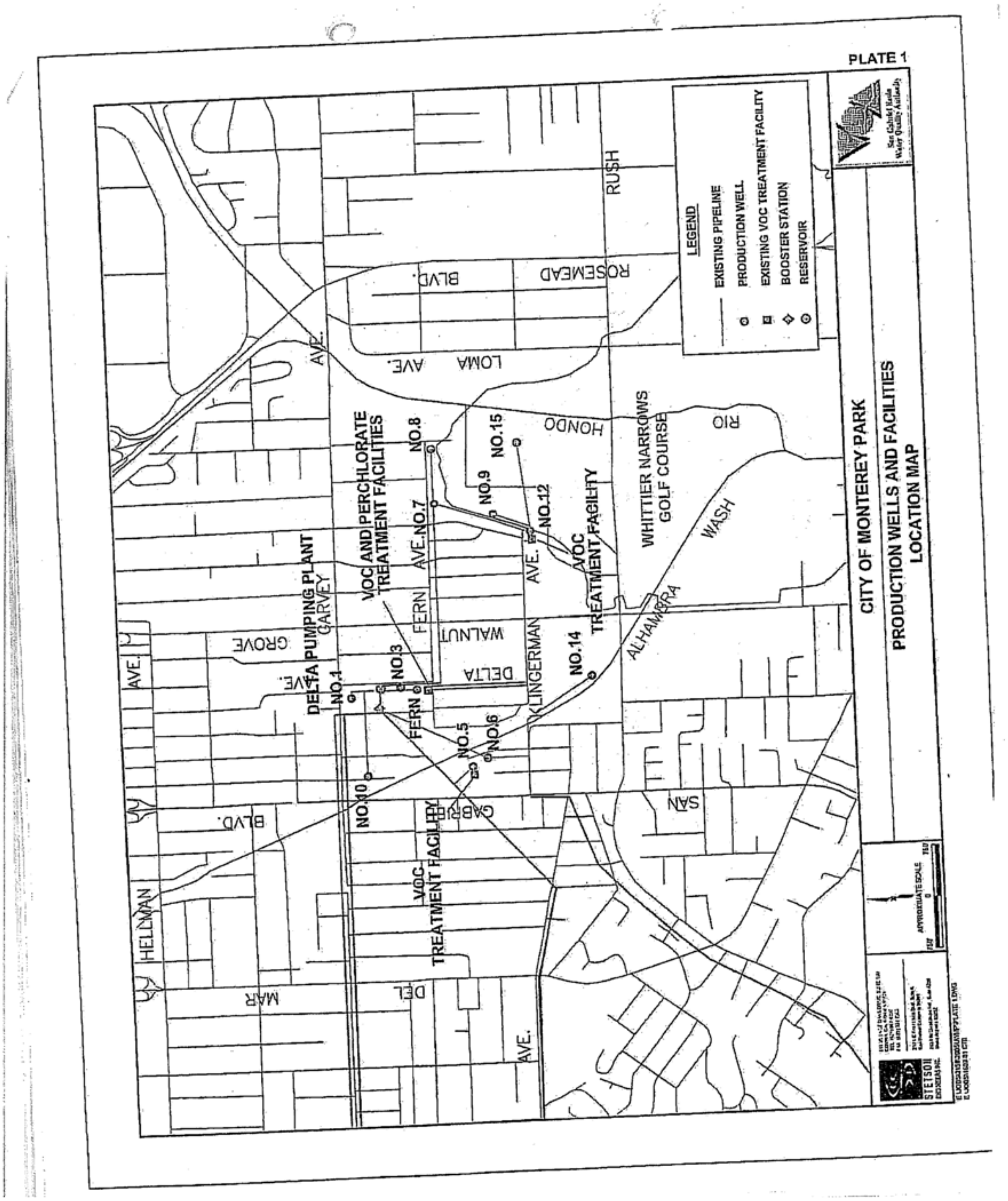
Recommendation: Approve the revised LHMP for compliance of the Disaster Mitigation Act of 2000.

Upon a motion by Mayor Pro Tem Ing and seconded by Council Member Lau, the motion was approved by the following vote:

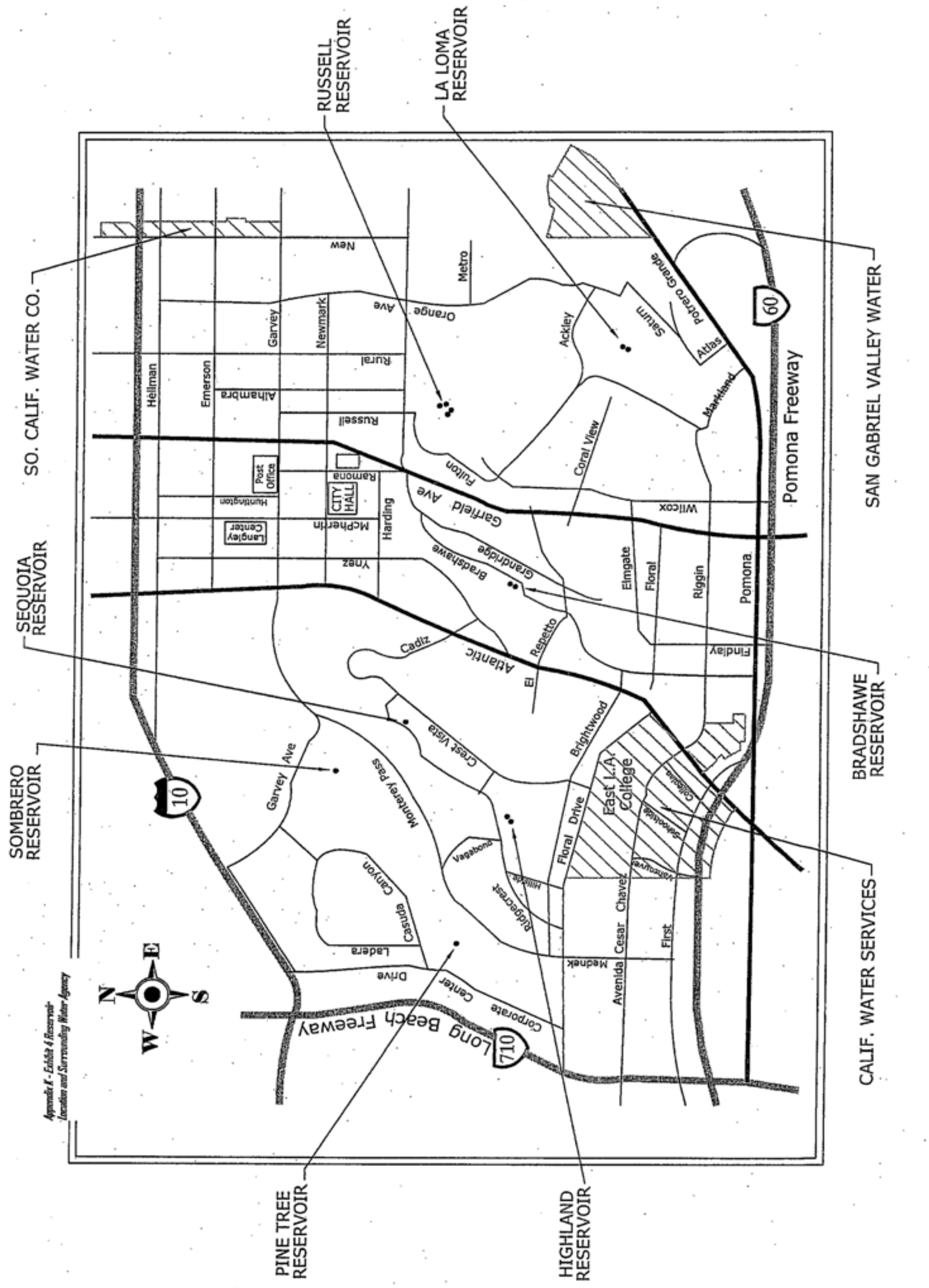
AYES:	COUNCIL MEMBERS: Martinez, Lau, Wong, Ing, Venti
NOES:	COUNCIL MEMBERS: None
ABSENT:	COUNCIL MEMBERS: None
ABSTAIN:	COUNCIL MEMBERS: None

Certified by:

David M. Barron, CMC, City Clerk
City of Monterey Park, California



Production and Well Facilities Map
Plate 1



Monterey Park Reservoir Locations
Plate 2

Exhibit 3
CITY OF MONTEREY PARK
WATER DEPARTMENT – LOCATIONS/ADDRESSES

TREATMENT PLANTS	
WELLS 9, 12, 15 VOC Treatment Plant	8817 Klingerman Avenue, Rosemead 91770
WELL 5 Treatment Plan	2450 No. Charlotte Avenue, Rosemead 91770
ION Exchange Treatment Plant	2657 No. Delta Avenue, Rosemead 91770
WELLS 1, 3, 10 GAC Treatment Plant	2657 No. Delta Avenue, Rosemead 91770
DB GAC Treatment Plant	2657 No. Delta Avenue, Rosemead 91770

WELLS:	
WELL 1	2745 No. Delta Avenue, Rosemead 91770
WELL 3	2745 No. Delta Avenue, Rosemead 91770
FERN WELL	2657 No. Delta Avenue, Rosemead 91770
WELLS 5, 6	2650 No. Charlotte Avenue, Rosemead 91770
WELLS 7, 8, 9	8830 E. Fern, Rosemead 91770
WELL 10	2719 No. Gladys, Rosemead 91770
WELL 12	8815 Klingerman Avenue, Rosemead 91770
WELL 14	2121 Walnut Grove, Rosemead 91770
WELL 15	8830 E. Fern, Rosemead 91770 *Inside Golfcourse @ East Property Line

RESERVOIRS:	
Reservoirs 1A, 2A	750 So. Russell, Monterey Park 91755
Reservoirs 3, 3A	1001 Bradshawe Pl., Monterey Park 91754
Reservoir 4	746 Ridgecrest, Monterey Park 91754
Reservoirs 5, 5A	1980 Clover Drive, Monterey Park 91755
Reservoirs 6, 6A	1140 Highland Drive, Monterey Park 91754
Reservoir 7	1320 Sombrero Drive, Monterey Park 91754
Reservoir 8	2167 Arriba Drive, Monterey Park 91754

BOOSTER PLANTS:	

Delta Pumping Plant	2657 No. Delta Avenue, Rosemead 91770
Vagabond Plant	1490 Vagabond, Monterey Park 91754
Kingsford Plant	707 Kingsford, Monterey Park 91755
Bradshawe Plant	1009 Bradshawe Pl., Monterey Park 91755
Country Plant	919 Country Rd., Monterey Park 91755
Ackley Plant	567 Ackley, Monterey Park 91755
La Loma Plant	1980 Clover Drive, Monterey Park 91755
Russell Plant	750 So. Russell Avenue, Monterey Park 91755
Brightwood Plant	1201 Brightwood Street, Monterey Park 91755
Sombrero Plant	1310 Sombrero Drive, Monterey Park 91754
Sequoia Plant	736 So. Crestvista, Monterey Park 91754

CLA VALVES CONTROLLED @ DELTA	
Briercliff CLA VALVE	1048 Briercliff ,Monterey Park 91754
SGVWD Innerconnection CLA VALVE	8830 E. Fern , Rosemead 91770

EXECUTIVE SUMMARY:

Five -Year Action Plan Matrix

The City of Monterey Park Local Hazards Mitigation Plan includes resources and information to assist City residents, public and private sector organizations, and others interested in participating in planning for natural and man-made hazards. The Mitigation Plan provides a list of activities that may assist Monterey Park in reducing risk and preventing loss from future natural or man-made hazard events. The action items address multi-hazard issues, as well as activities for earthquakes, flooding, wind storms, landslides, wildfires, drought and man-made hazards.

How is the Plan Organized?

The Mitigation Plan contains a five-year action Plan matrix, background on the purpose and methodology used to develop the Mitigation Plan, a profile of Monterey Park, sections on seven hazards that occur within the City, and a number of appendices. All of the sections are described in detail in Section 1, the Plan introduction.

Who Participated in Developing the Plan?

The City of Monterey Park Local Hazards Mitigation Plan is the result of a collaborative effort between Monterey Park citizens, public agencies, non-profit organizations, the private sector, and regional and state organizations. Public participation played a key role in development of goals and action items. Interviews were conducted with stakeholders across the City, and two public workshops were held previously to include City of Monterey Park residents in Plan development. The City provided a link on its website to allow for ongoing citizen/stakeholder input. A project Steering Committee guided the process of developing the Plan.

The Steering Committee was comprised of representatives from:

- ✓ City of Monterey Park Building and Safety
- ✓ City of Monterey Park Fire Department
- ✓ City of Monterey Park Police Department
- ✓ City of Monterey Park Economic Development
- ✓ City of Monterey Park Emergency Services Coordinator
- ✓ City of Monterey Park Finance
- ✓ City of Monterey Park Information Technology
- ✓ City of Monterey Park Planning
- ✓ City of Monterey Park Community Development
- ✓ City of Monterey Park Public Information
- ✓ City of Monterey Park Public Works Department
- ✓ City of Monterey Park Community Services

- ✓ Office of Disaster Management, Area C
- ✓ State Division of Mines and Geology
- ✓ Federal Emergency Management Agency
- ✓ Southern California Association of Governments
- ✓ Governor's Office of Emergency Services

What is the Plan Mission?

The mission of the City of Monterey Park Local Hazards Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural and manmade hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City towards building a safer, more sustainable community.

What are the Plan Goals?

The Plan goals describe the overall direction Monterey Park agencies, organizations, and citizens can take to work toward mitigating risk from natural and manmade hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations outlined in the action items.

Thorough evaluation of hazard threats has enabled the development of mitigation goals that are designed to minimize the impact of future disasters. Minimizing the impact of these events is essential to the continued economic and social stability of the community.

The Plan Goals were developed by examining the history of disasters in Monterey Park and the surrounding communities. In the case of seismic events, it was necessary to evaluate the impact of past events that have affected other communities due to the infrequent occurrence, but high impact of these events. Other events like wildfires and landslides occur with greater frequency and make evaluation and mitigation goal development more area specific.

Goals are prioritized by categories 1, 2 and 3. Category 1 is the highest priority.

<u>Protect Life and Property:</u>

- ✓ Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural and manmade hazards. Priority 1.

- ✓ Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage and mitigation efforts for catastrophic hazards such as landslides and seismic events. Priority 2.

- ✓ Improve hazard assessment information to make recommendations for discouraging new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural hazards. Priority 3.

Public Awareness:

- ✓ Develop and implement education and outreach programs to increase public awareness of the risks associated with natural and manmade hazards. Priority 2.

- ✓ Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities. Priority 3.

Natural Systems:

- ✓ Balance natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment. Priority 3.

- ✓ Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions. Priority 3.

Partnerships and Implementation:

- ✓ Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, business, and industry to gain a vested interest in implementation. Priority 2.

- ✓ Encourage leadership within public and private sector organizations to prioritize and implement local and regional hazard mitigation activities. Priority 3.

Emergency Services:

- ✓ Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure. **Priority 1**.

- ✓ Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry as well as the increased involvement of the public at large. Priority 1.

- ✓ Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures. Priority 2.

How are the Action Items Organized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that City agencies may implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years (or more) to implement.

The action items are organized within the following matrix, which lists all of the multi-hazard and hazard-specific action items included in the Mitigation Plan. Data collection and research and the public participation process resulted in the development of these action items (see Appendix B). The matrix includes the following information for each action item:

Coordinating Organization:

The coordinating organization is the public agency with regulatory responsibility to address local hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, county, or regional agencies that are capable of or responsible for implementing activities and programs.

At the direction of the City Manager, the Monterey Park Fire Department has been tasked as the coordinating agency for plan development and maintenance. The Office of the City Manager retains the responsibility for plan implementation and compliance.

Timeline:

Action items include both short and long-term activities. Each action item includes an estimate of the time line for implementation. Short-term action items are activities which City agencies are capable of implementing with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years (or more) to implement.

Ideas for Implementation:

Each action item includes ideas for implementation and potential resources, which may include grant programs or human resources. The matrix includes the page number within the Mitigation Plan where this information can be found.

Plan Goals Addressed:

The Plan goals addressed by each action item are included as a way to monitor and evaluate how well the Mitigation Plan is achieving its goals once implementation begins. The Plan goals are organized into the following five areas:

- ✓ Protect Life and Property
- ✓ Public Awareness
- ✓ Natural Systems
- ✓ Partnerships and Implementation
- ✓ Emergency Services

Partner Organizations:

The Partner organizations are not listed with the individual action items or in the Plan matrix. Partner organizations are listed in Appendix A, of this Plan and are agencies or public/private sector organizations that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization. The partner organizations listed in the Resource Directory of the City of Monterey Park Local Hazards Mitigation Plan are potential partners recommended by the project steering committee, but were not necessarily contacted during the development of the Mitigation Plan. Partner organizations should be contacted by the coordinating organization to establish commitment of time and resources to action items.

Constraints:

Constraints may apply to some of the action items. These constraints may be a lack of city staff, lack of funds, or vested property rights, which might expose the City to legal action as a result of adverse impacts on private property.

How Will the Plan be Implemented, Monitored, and Evaluated?

The Plan Maintenance Section of this document details the formal process that will ensure that the City of Monterey Park Local Hazards Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a Plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the City of Monterey Park government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City's General Plan, Emergency Operations Plan, Capital Improvement Plans, and Building & Safety Codes.

Plan Adoption

Adoption of the Local Hazard Mitigation Plan by the local jurisdiction's governing body is one of the prime requirements for approval of the Plan. Once the Plan is completed, the City Council will be responsible for adopting the City of Monterey Park Local Hazards Mitigation Plan. The local agency governing body has the responsibility and authority to promote sound public policy regarding local hazards. The City Council will periodically need to re-adopt the Plan as it is revised to meet changes in the natural hazard risks and exposures in the community. The approved Local Hazard Mitigation Plan will be significant in the future growth and development of the community.

Coordinating Body

A City of Monterey Park Hazard Mitigation Advisory Committee will be responsible for coordinating implementation of Plan action items and undertaking the formal review process. The City Manager, or designee, will assign representatives from City agencies, including, but not limited to, the current Hazard Mitigation Advisory Committee members.

Convener

The City Council will adopt the City of Monterey Park Local Hazard Mitigation Plan, and the Hazard Mitigation Advisory Committee will take responsibility for Plan implementation. The City Manager, or designee, will serve as a convener to facilitate the Hazard Mitigation Advisory Committee meetings, and will assign tasks such as updating and presenting the Plan to the members of the committee. Plan implementation and evaluation will be a shared responsibility among all of the Local Hazard Advisory Committee Members.

Implementation through Existing Programs

The City of Monterey Park addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and City Building & Safety Codes. The Local Hazard Mitigation Plan provides a series of recommendations that are closely related to the goals and objectives of these existing planning programs. The City of Monterey Park will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency's approaches to identify costs and benefits associated with natural hazard mitigation strategies or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural and manmade hazards can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Formal Review Process

The City of Monterey Park Local Hazards Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and time line, and identifies the local agencies and organizations participating in Plan evaluation. The convener will be responsible for contacting the Hazard Mitigation Advisory Committee members and organizing the annual meeting. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

Continued Public Involvement

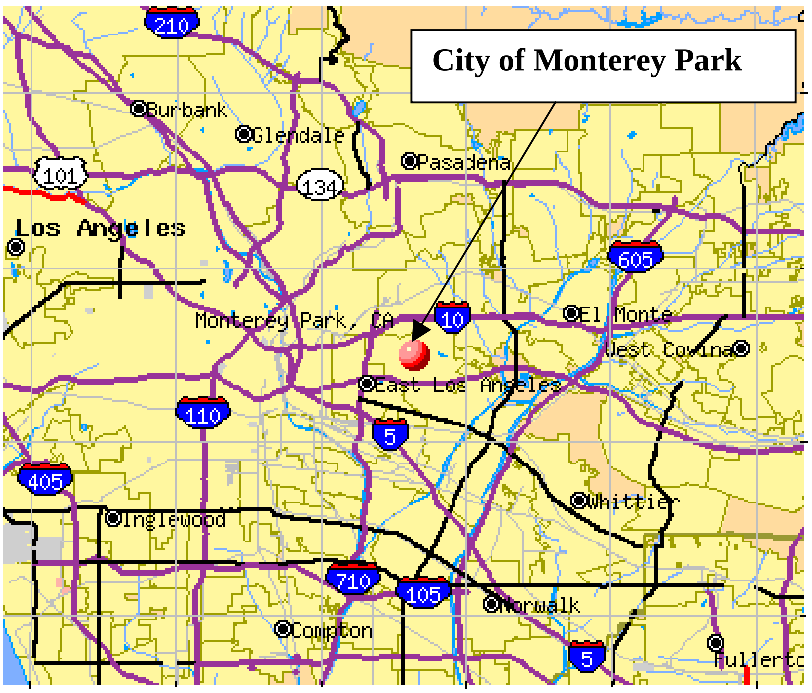
The City of Monterey Park is dedicated to involving the public directly in the continual review and updates of the Hazard Mitigation Plan. Copies of the Plan will be catalogued and made available at City Hall and at the City operated public library. The existence and location of these copies will be publicized in the City newsletter. The Plan also includes the address and the phone number of the City Planning Division, responsible for keeping track of public comments on the Plan. In addition, copies of the Plan and any proposed changes will be posted on the City website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

SECTION 1:
- Introduction -

Throughout history, the residents of the City of Monterey Park have dealt with the various hazards affecting the area. Photos, journal entries, and newspapers from the 1800's show that the residents of the area dealt with earthquakes, earth movements, flooding, wildfire, and wind storms.

Although there were fewer people in the area, the hazards adversely affected the lives of those who depended on the land and climate conditions for food and welfare. As the population of the City continues to increase, the exposure to hazards creates an even higher risk than previously experienced.

The City of Monterey Park is the 31st most populous City in Los Angeles County, and offers the benefits of living in a Mediterranean type of climate. The City is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disaster situations.



The City is subject to earthquakes, earth movements, flooding, wildfire, and windstorms. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the City. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from these natural disasters.

The City of Monterey Park most recently experienced some destruction during the 1987 Whittier Narrows earthquake.

Why Develop a Mitigation Plan?

As the costs of damage from natural and manmade disasters continues to increase, the community realizes the importance of identifying effective ways to reduce vulnerability to disasters. A local hazards mitigation plan assists communities in reducing risk from hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

Decades of improving the life-safety requirements in building codes have greatly reduced the risk of death in earthquakes, yet Southern California's and Monterey Park's social and economic stability are still at risk and vulnerable to large scale disruptions. Earthquakes are only one threat to stability in the region. Hazards, natural and man-made, must be considered and planned for before they occur in order to minimize their impact. Fortunately, steps can be taken now that can change the outcome of a future disaster and repay any costs many times over. Mitigation planning must be undertaken now and in the future to maintain a level of readiness and resiliency.

The plan provides a set of action items to reduce risk from natural and man-made hazards through education and outreach programs and to foster the development of partnerships, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from natural and man-made hazards.

The resources and information within the Mitigation Plan:

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

The mitigation plan works in conjunction with other City plans, including the City General Plan and Emergency Operations Plans.

Whom Does the Mitigation Plan Affect?

The City of Monterey Park Local Hazards Mitigation Plan affects entire city. The maps in Section 2 show major roads in the City of Monterey Park. This plan provides a framework for planning for natural and man-made hazards. The resources and background information in the plan is applicable City-wide, and the goals and recommendations can lay groundwork for local mitigation plans and partnerships.

Natural Hazard Land Use Policy in California:

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

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

This is particularly true in the case of planning for natural hazards where communities must balance development pressures with detailed information on the nature and extent of hazards.

Planning for Natural Hazards, calls for local plans to include inventories, policies, and ordinances to guide development in hazard areas. These inventories should include the compendium of hazards facing the community, the built environment at risk, the personal property that may be damaged by hazard events, and most of all, the people who live in the shadow of these hazards.

Support for Natural Hazard Mitigation:

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

- ✓ The Governor's Office of Emergency Services (OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;

- ✓ The Southern California Earthquake Center (SCEC), gathers information about earthquakes, integrates this information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.

- ✓ The California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, the development of partnerships aimed at reducing risk, and exceptions (based on science-based refinement of tsunami inundation zone delineation) to state mandated tsunami zone restrictions; and

- ✓ The California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance

Plan Methodology:

Information in the Mitigation Plan is based on research from a variety of sources. Staff from the City of Monterey Park conducted data research and analysis, facilitated coordinating committee meetings and public meetings, and developed the final mitigation plan. The research methods and various contributions to the plan include:

Input From the Coordinating Committee:

The Hazard Mitigation Advisory Committee convened about every 4 weeks (a total of 6 meetings) to guide development of the Mitigation Plan. The committee played an integral role in developing the mission, goals, and action items for the mitigation plan. The committee consisted of representatives of public and private agencies and organizations in City of Monterey Park, including:

City of Monterey Park Building and Safety
City of Monterey Park Emergency Management
City of Monterey Park Fire Department
City of Monterey Park Police Department
City of Monterey Park Finance
City of Monterey Park Information technology
City of Monterey Park Planning
City of Monterey Park Public Information Officer
City of Monterey Park Streets Department
City of Monterey Park Water

Stakeholder Interviews

City staff conducted interviews with individuals and specialists from organizations interested in natural hazards planning. The interviews identified common concerns related to natural hazards and identified key long and short-term activities to reduce risk from natural hazards. A complete listing of all stakeholders is located in Appendix B. Stakeholders interviewed for the plan included representatives from:

Water Providers
School District(s)
Los Angeles County Fire Department
Los Angeles County Public Works
Los Angeles County Office of Emergency Management
Utility Providers
Local Businesses
City of Monterey Park Chamber of Commerce

Plan Authors

The LHMP for the City of Monterey Park is a collaborative effort by the following city departments and individuals:

City of Monterey Park Fire Department –	Coordinating Department
Fire Chief Cathleen Orchard –	Coordinating Department Head
Battalion Chief James Birrell –	Interdepartmental Liaison Officer
Captain Shannon Files –	FEMA and OES Point of Contact
Engineer Matt Hallock –	Wildfire Section Author

City of Monterey Park Police Department – Contributing Department

Captain James Smith –	Manmade Hazards Author

City of Monterey Park Building and Safety – Contributing Department

Elias Saykali –	Coordinating Department Head
Rey Alfonso –	Earthquake Section Author
Rey Alfonso –	Flooding Section Author
Rey Alfonso –	Landslides Section Author
Rey Alfonso –	Windstorms Section Author

City of Monterey Park Public Works – Water Department

Victor Meza –	Water/ Drought Section Author
Chris Arriola –	Contributor

City of Monterey Park City Manager's Office

June Yotsuya –	City Manager, Jurisdiction Management
Vickie Banando –	Ordinance Submission

There were a great many contributors to the completion of the LHMP. All contributors were diligent in their efforts to provide timely and accurate information.

State and Federal Guidelines and Requirements for Mitigation Plans

Following are the Federal requirements for approval of a Local Hazard Mitigation Plan:

- ✓ Open public involvement, with public meetings that introduce the process and project requirements.

- ✓ The public must be afforded opportunities for involvement in: identifying and assessing risk, drafting a plan, and public involvement in approval stages of the plan.

- ✓ Community cooperation, with opportunity for other local government agencies, the business community, educational institutions, and non-profits to participate in the process.

- ✓ Incorporation of local documents, including the local General Plan, the Zoning Ordinance, the Building Codes, and other pertinent documents.

The following components must be part of the planning process:

- ✓ Complete documentation of the planning process;

- ✓ A detailed risk assessment on hazard exposures in the community;

- ✓ A comprehensive mitigation strategy, which describes the goals and objectives, including proposed strategies, programs & actions to avoid long-term vulnerabilities;

- ✓ A plan maintenance process, which describes the method and schedule of monitoring, evaluating and updating the plan and integration of the All Hazard

Mitigation Plan into other planning mechanisms;

- ✓ Formal adoption by the City Council; and
- ✓ Plan Review by both State OES and FEMA

These requirements are spelled out in greater detail in the following plan sections and supporting documentation.

A minimum of two public meetings (or other public forums) is recommended to meet the requirement for public participation, in addition to the inclusion of representatives from outside organizations on the planning committee itself. The timing and scheduling of the meetings may vary from one community to another depending on how each city's committee organizes its work and the particular needs of the community.

City of Monterey Park staff examined existing mitigation plans from around the country, current FEMA hazard mitigation planning standards (386 series) and the State of California Local Hazards Mitigation Plan Guidance.

Other reference materials consisted of county and city mitigation plans, including:

- ✓ Clackamas County (Oregon) Natural Hazards Mitigation Plan
- ✓ State of Washington Natural Hazards Mitigation Plan
- ✓ Los Angeles Specific Planning Guidebook provided by the DMAC's of Area's D,E, and F

Hazard Specific Research:

Monterey Park staff collected data and compiled research on seven hazards: earthquakes, flooding, landslide, wildfire, windstorms, drought and manmade hazards. Research materials came from state agencies including OES, and CDF. The City of Monterey Park staff conducted research by referencing historical local newspapers, interviewing long time residents, long time City of Monterey Park employees and locating City of Monterey Park information in historical documents.

The City of Monterey Park staff identified current mitigation activities, resources and programs, and potential action items from research materials and stakeholder interviews.

Various research materials are referenced throughout the text and appendices. LHMP documents from other jurisdictions were reviewed and used in the development of the LHMP for the City of Monterey Park. These plans include, but are not limited to the following:

Natural Hazard Mitigation Plan, City of Arcadia, CA
Natural Hazard Mitigation Plan, City of Monrovia, CA
Natural Hazard Mitigation Plan, City of San Leandro, CA

Natural Hazard Mitigation Plan, City of Montebello, CA
Multi-Jurisdiction Hazard Mitigation Plan,
City of Pico Rivera, CA
El Rancho Unified School District
Pico Water
Local Hazards Mitigation Plan, County of Riverside, CA
Local Hazards Mitigation Plan, County of Los Angeles, CA

Public Meetings:

City of Monterey Park staff facilitated two public meetings to gather comments and ideas from City of Monterey Park citizens about mitigation planning and priorities for mitigation plan goals. The first meeting was held May 1, 2008, and the second meeting was held May 19, 2008. Please refer to Appendix B for meeting details.

The resources and information cited in the mitigation plan provide a strong local perspective and help identify strategies and activities to make City of Monterey Park more disaster resilient.

How the Plan is Used:

Each section of the mitigation plan provides information and resources to assist people in understanding the City and the hazard-related issues facing citizens, businesses, and the environment. Combined, the sections of the plan work together to create a document that guides the mission to reduce risk and prevent loss from future natural and man-made hazard events.

The structure of the plan enables people to use a section of interest to them. It also allows City government to review and update sections when new data becomes available. The ability to update individual sections of the mitigation plan places less of a financial burden on the City. Decision-makers can allocate funding and staff resources to selected pieces in need of review, thereby avoiding a full update, which can be costly and time-consuming.

New data can be easily incorporated, resulting in a local hazards mitigation plan that remains current and relevant to the City of Monterey Park.

The mitigation plan is organized in three volumes. Volume I contains an executive summary, introduction, City profile, risk assessment and multi-hazard, plan maintenance Volume II contains the seven hazard sections and Volume III includes the appendices. Each section of the plan is described below.

Volume I: Mitigation Action Plan:

Executive Summary: Five-Year Action Plan

The Five-Year Action Plan provides an overview of the mitigation plan mission, goals, and action items. The plan action items are included in this section, and address multi-hazard issues, as well as hazard-specific activities that can be implemented to reduce risk and prevent loss from future hazard events.

Section 1: Introduction

The Introduction describes the background and purpose of developing the mitigation plan for the City of Monterey Park.

Section 2: Community Profile

This section presents the history, geography, demographics, and socioeconomics of City of Monterey Park. It serves as a tool to provide an historical perspective of natural hazards in the City.

Section 3: Risk Assessment

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

Section 4: Multi-Hazard Goals and Action Items

This section provides information on the process used to develop goals and action items that cut across the seven hazards addressed in the mitigation plan.

Section 5: Plan Maintenance

This section provides information on plan implementation, monitoring and evaluation.

Volume II: Hazard Specific Information:

Hazard-Specific Information on the seven chronic hazards are addressed in this plan. Chronic hazards occur with some regularity and may be predicted through historic evidence and scientific methods. The chronic hazards addressed in the plan include:

Section 6: Earthquake
Section 7: Flooding
Section 8: Landslide
Section 9: Wildfire
Section 10: Windstorm
Section 11: Drought

Section 12: Manmade Hazards

Catastrophic hazards do not occur with the frequency of chronic hazards, but can have devastating impacts on life, property, and the environment. In southern California, because of the geology and terrain, earthquake, earth movement, flooding, and wildfire also have the potential to be catastrophic as well as chronic hazards. For the coastal areas of southern California, tsunamis, while very rare, have the potential to calamitously devastate low-lying coastal areas.

Each of the hazard-specific sections includes information on the history, hazard causes and characteristics, hazard assessment, goals and action items, and local, state, and national resources.

Volume III: Resources:

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

Appendix A: Plan Resource Directory

The resource directory includes City, regional, state, and national resources and programs that may be of technical and/or financial assistance to the City of Monterey Park during plan implementation.

Appendix B: Public Participation Process

This appendix includes specific information on the various public processes used during development of the plan.

Appendix C: Benefit Cost Analysis

This section describes FEMA's requirements for benefit cost analysis in local hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities.

Appendix D: List of Acronyms

This section provides a list of acronyms for City, regional, state, and federal agencies and organizations that may be referred to within the City of Monterey Park Local Hazards Mitigation Plan.

Appendix E: Glossary

This section provides a glossary of terms used throughout the plan.

SECTION 10:
- Windstorms –

Table of Contents

Why are Severe Windstorms a Threat to the City of Monterey Park?

Windstorms:

Severe windstorms pose a significant risk to life and property in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses. Severe windstorms can present a very destabilizing effect on the dry brush that covers local hillsides and urban wildland interface areas. High winds can have destructive impacts, especially to trees, power lines, and other utility services.

Windstorm Characteristics in Southern California:

Santa Ana Winds and Tornado-Like Wind Activity:

Based on local history, most incidents of high winds in the City of Monterey Park are the result of the Santa Ana wind conditions. While high impact incidents are not frequent in the area, significant Santa Ana Wind events and sporadic tornado activity have been known to negatively impact the local community.

What are Santa Ana Winds?

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

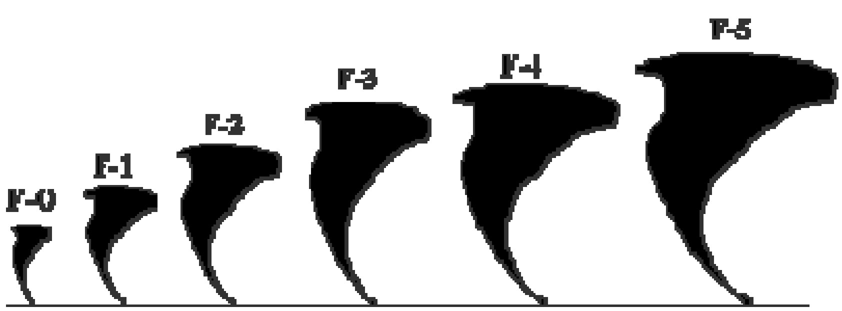
The complex topography of Southern California combined with various atmospheric conditions create numerous scenarios that may cause widespread or isolated Santa Ana events. Commonly, Santa Ana winds develop when a region of high pressure builds over the Great Basin (the high plateau east of the Sierra Mountains and west of the Rocky Mountains, including most of Nevada and Utah). Clockwise circulation around the center of this high pressure area forces air downslope from the high plateau. The air warms as it descends toward the California coast at the rate of 5 degrees Fahrenheit per 1000 feet due to compressional heating. Thus, compressional heating provides the primary source of warming. The air is dry since it originated in the desert, and it dries out even more as it is heated.

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

What are Tornados?

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

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

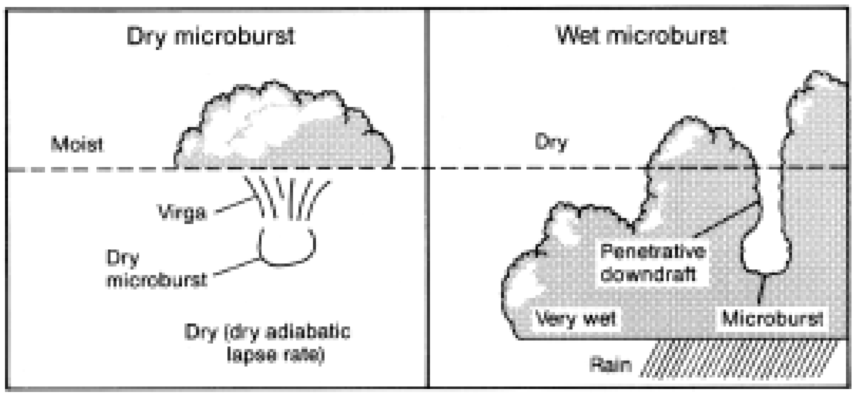


The chart below depicts the Fujita Tornado Damage Scale:

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

Microbursts:

Unlike tornados, microbursts are strong, damaging winds which strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. But unlike a tornado, they affect only a rather small area.

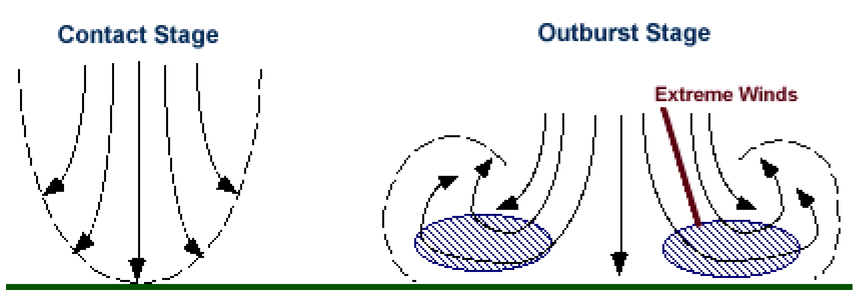


University of Chicago storm researcher Dr. Ted Fujita first coined the term "downburst" to describe strong, downdraft winds flowing out of a thunderstorm cell that he believed were responsible for the crash of Eastern Airlines Flight 66 in June of 1975.

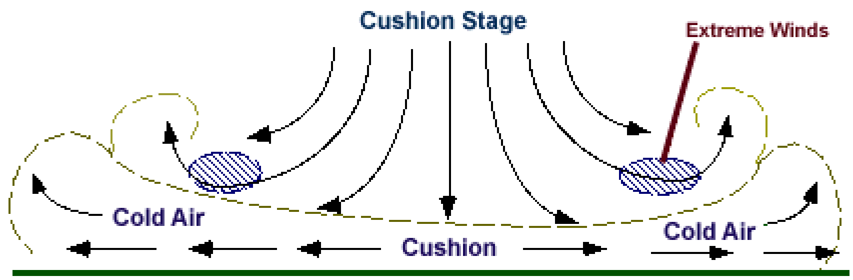
A downburst is a straight-direction surface wind in excess of 39 miles per hour caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms.

During Dr. Fujita's investigations into the phenomena, he defined two sub-categories of downbursts: the larger macrobursts and small microbursts.

Macrobursts are downbursts with winds up to 117 miles per hour which spread across a path greater than 2.5 miles wide at the surface and which last from 5 to 30 minutes. The microburst, on the other hand, is confined to an even smaller area, less than 2.5 miles in diameter from the initial point of downwdraft impact. An intense microburst can result in damaging winds near 170 miles per hour and often lasts for less than five minutes.



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



When the microburst wind hits an object on the ground such as a house, garage, or tree, it can flatten the buildings and strip limbs and branches from the tree. After striking the ground, the powerful outward running gust can wreak further havoc along its path.

Damage associated with a microburst is often mistaken for the work of a tornado, particularly directly under the microburst. However, damage patterns away from the impact area are characteristic of straight line winds rather than the twisted pattern of tornado damage.

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

Local History of Windstorm Events:

The following Santa Ana wind events were featured in news resources during 2003:

January 6, 2003 OC Register	"One of the strongest Santa Ana windstorms in a decade toppled 26 power poles in Orange early today, blew over a mobile derrick in Placentia, crushing two vehicles, and delayed Metrolink rail service." This windstorm also knocked out power to thousands of people in northeastern Orange County.
January 8, 2003 CBSNEWS.com	"Santa Ana's roared into Southern California late Sunday, blowing over trees, trucks and power poles. Thousands of people lost power."
March 16, 2003 dailybulletin.com	Fire Officials Brace for Santa Ana Winds - - "The forest is now so dry and so many trees have died that fires, during relatively calm conditions, are running as fast and as far as they might during Santa Ana Winds. Now the Santa Ana season is here. Combine the literally tinder dry conditions with humidity in the single digits and 60-80 mph winds, and fire officials shudder."

While the effects of Santa Ana Winds are often overlooked, it should be noted that in 2003, two deaths in Southern California were directly related to the fierce condition. A falling tree struck one woman in San Diego and a second death occurred when a passenger in a vehicle was hit by a flying pickup truck cover launched by the Santa Ana winds.

Windstorm Hazard Identification

A windstorm event in the region can range from short-term microburst activity lasting only minutes, to a long duration Santa Ana wind condition which may last for several days. This was the case in a January 2003 Santa Ana wind event. Windstorms in the City of Monterey Park and surrounding area can cause extensive damage including the destruction of tree strands, road and highway infrastructure, and critical utility facilities. Fortunately, the City has not suffered any major incidents in the recent past.

Vulnerability and Risk:

With an analysis of the high wind and tornado events as depicted, we can deduce the common windstorm impact areas including the effect on life, property, utilities, infrastructure, and transportation. Additionally, if a windstorm disrupts power to local residential communities, the American Red Cross and City resources might be called upon for care and shelter duties. Displacing residents and utilizing City resources for shelter staffing and disaster cleanup can cause an economic hardship on the community.

Santa Ana Wind Illustration

The illustration as follows shows clearly the direction of the Santa Ana winds as they travel from the stable, high pressure weather system called the great Basin High through the canyons and towards the low pressure system off the Pacific. Clearly, the City of Monterey Park is in the direct path of the ocean bound Santa Ana winds.

Community Windstorm Issues

What is Susceptible to Windstorms?

Life and Property:

Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region. Obviously, the City of Monterey Park and surrounding region can be adversely impacted during a windstorm event.

This can result in the involvement of the City of Monterey Park's emergency response personnel during a wide-ranging windstorm or microburst tornadic activity.

Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail, causing considerable damage.

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

The Beaufort Scale as illustrated below, illustrates the effect that varying wind speed can have on sea swells and structures.

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

Source: http://www.compuweather.com/decoder-charts.html

Utilities:

Historically, falling trees have been the major cause of power outages in the region. Windstorms such as strong microbursts and Santa Ana Wind conditions can cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet. As such, overhead power lines can be damaged even in relatively minor windstorm events. Falling trees can bring electric power lines down to the pavement, creating the possibility of lethal electric shock. Rising population growth and new infrastructure in the region creates a higher probability for damage to occur from windstorms as more life and property are exposed to risk.

Infrastructure:

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

Windstorms can result in collapsed or damaged buildings or blocked roads and bridges, damaged traffic signals, streetlights, and parks, among others. Roads blocked by fallen trees during a windstorm may have severe consequences to people who need access to emergency services. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric services and from extended road closures. They can also sustain direct losses to buildings, personnel, and other vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damages and interrupted services.

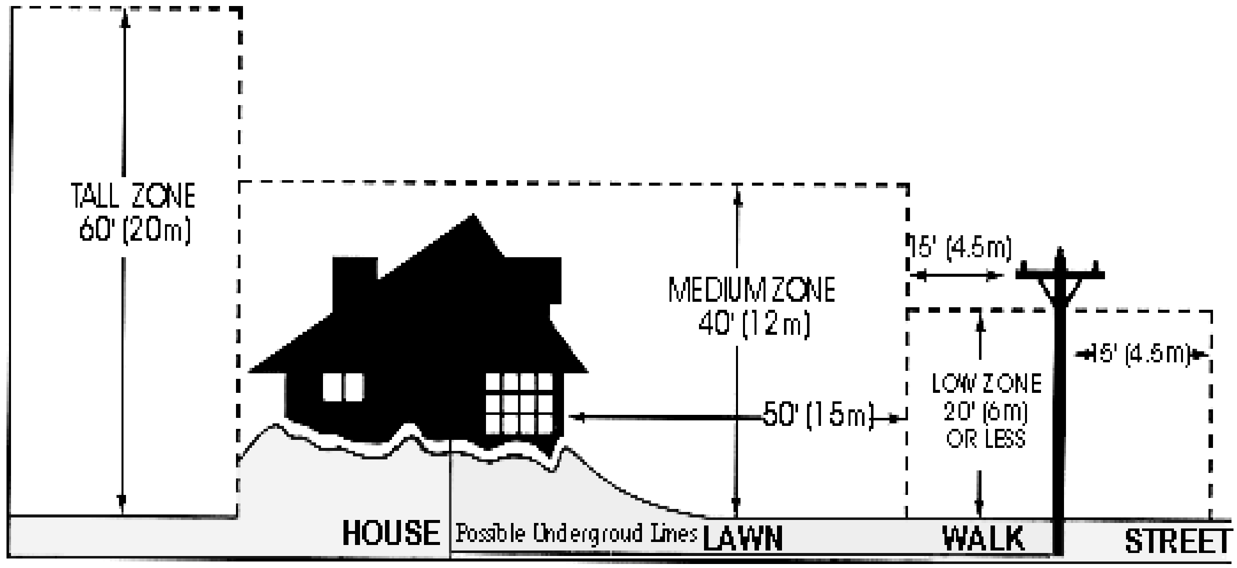
Increased Fire Threat:

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur every few years in the urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions. The higher fire hazard raised by a Santa Ana wind condition requires that even more care and attention be paid to proper brush clearances on property in the wildland/urban interface areas.

Transportation:

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

Existing Windstorm Mitigation Activities:

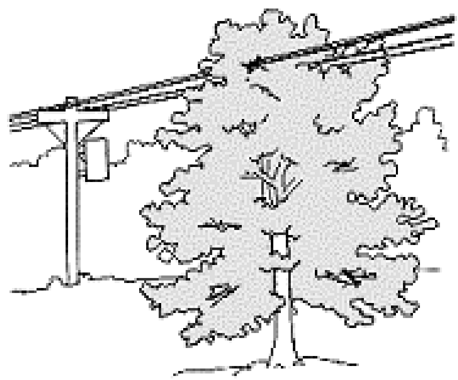


As stated, one of the most common problems associated with windstorms is power outage. High winds commonly occur during winter storms, and can cause trees to bend, sag, or fail (tree limbs or entire trees), coming into contact with nearby distribution power lines. Fallen trees can cause short-circuiting and conductor overloading. Wind-induced damage to the power system causes power outages to customers, incurs cost to make repairs, and in some cases can lead to ignitions that start wild land fires.
One of the strongest and most widespread existing mitigation strategies pertains to tree clearance. Currently, California State Law requires utility companies to maintain specific clearances (depending on the type of voltage running through the line) between electric power lines and all vegetation.
Enforcement of the following California Public Resource Code Sections provides guidance on tree pruning regulations.

4293: Power Line Clearance Required
4292: Power Line Hazard Reduction
4291: Reduction of Fire Hazards Around Buildings
4171: Public Nuisances

The following pertain to tree pruning regulations and are taken from the California Code of Regulations:

> Title 14: Minimum Clearance Provisions
> Sections: 1250 – 1258
> General Industry Safety Orders
>
> Title 8: Group 3: Articles 12, 13, 36,3 7, 38
>
> California Penal Code: Section 385



Finally, the following California Public Utilities commission section has additional guidance:

> California Public utilities Commission
> General Order 95: rule 35

Homeowner Liability:

Failure to allow a utility company to comply with the law can result in liability to the homeowner for damages or injuries resulting from a vegetation hazard. Many insurance companies do not cover these types of damages if the policy owner has refused to allow the hazard to be eliminated.

The power companies, in compliance with the above regulations, collect data about tree failures and their impact on power lines. This mitigation strategy assist the power company in preventing future tree failures. From the collection of this data, the power company can advise residents as to the most appropriate vegetative planting and pruning procedures. The local electric utility, Southern California Edison, provides extensive information on trees and power lines at their website: www.sce.com.

Windstorm Mitigation Action Items

The windstorm mitigation action items provide direction on specific activities that organizations and residents in the City of Monterey Park can undertake to reduce risk and prevent loss from windstorm events. Each action item is followed by ideas for implementation, which can be used by the Hazard Mitigation Planning Committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

Long Term - Windstorm #1:

Public Awareness Campaign: To provide public education materials to City of Monterey Park residents and all School District staff, parents and age-appropriate students with mitigation materials pertaining to the protection of life and property before, during, and after a windstorm.

Ideas for Implementation:

- ✓ Compile mitigation brochures from the following organizations: FEMA; California Public Utilities Commission; County of Los Angeles Public Works; Southern California Edison; Tree Line Connection
- ✓ Distribute these materials to City of Monterey Park residents and school district members. Materials can be distributed at City Council Meetings, Commission Meetings, City Hall, Parks and Recreation Centers, Fire Departments, Police Departments, Chamber of Commerce Meetings, School Administration Offices and other appropriate venues.
- ✓ Create community PowerPoint seminar to be given at CERT/RACES joint hazard training event. Utilize presentation at future City Council Meetings or other public *events* as appropriate.

Coordinating Organization:	City of Monterey Park Emergency Services
Timeline:	Ongoing
Plan Goals Addressed:	Public Awareness, Protection of Life and Property
Constraints:	Pending funding and available personnel

Long Term - Windstorm #2:

Create local City and utility awareness of tree pruning and Fire Code Sections relevant to wind-resistant utility operations

Ideas for Implementation:

- ✓ Provide information to City Planning Departments and local utility companies encouraging compliance with State and Local tree clearance and integrity guidelines by:
- ✓ Compile comprehensive list of pertinent State and local regulations
- ✓ Send letters of encouragement from Hazard Mitigation Planning Committee and local City and School officials encouraging utility compliance with guidelines

Coordinating Organization:	Planning Dept, Public Works, Emergency Services Offices
Timeline:	Ongoing
Plan Goals Addressed:	Protection of life and property
Constraints:	Pending funding and available personnel

Long Term - Windstorm #3:

Encourage Critical City Facilities to purchase and/or test backup power facilities for use during a power failure. Create an equipment/testing log to ensure backup power equipment is in working service.

Ideas for Implementation:

- ✓ Gather all databases of backup power equipment for critical facilities.
- ✓ Test all critical facility backup power generators.
- ✓ Keep an accurate record of equipment specification and testing date information.

Coordinating Organization:	Public Works, Emergency Management
Timeline:	Ongoing
Plan Goals Addressed:	Ensure rapid disaster response
Constraints: `	Pending funding and available personnel

Windstorm Resource Directory

State Resources
California Division of Forestry & Fire Protection
1416 9th Street
PO Box 944246
Sacramento California 94244-2460
916-653-5123
http://www.fire.ca.gov/php/index.php

Federal Resources and Programs
National Weather Service
Los Angeles/Oxnard Weather Forecast Office
520 North Elevar Street
Oxnard, CA 93030
Forecast and weather info: 805-988-6610
Administrative issues: 805-988-6615
E-mail: Webmaster.LOX@noaa.gov
http://weather.noaa.gov/

Additional Resources

International Society of Arboriculture.
P.O. Box 3129
Champaign, IL 61826-3129
Phone: 217.355.9411
Fax: 217.355.9516
Web: www.isa-arbor.com
E-mail: isa@isa-arbor.com

Publications

WINDSTORMS: Protect Your Family and Property from the Hazards of Violent Windstorms
http://emd.wa.gov/5-prep/trng/pubed/Windstrm.pdf

Preparing Your Home for Severe Windstorms is available from
http://www.chubb.com/personal/html/helpful_tips_home_windstorm.html

SECTION 11:
- Water Vulnerability –

Table of Contents

Water Utility Operations

The City of Monterey Park Department of Public Works Water Utility Division (City) owns and operates a water production and distribution system serving the City of Monterey Park. The City's office is located at 751 South Alhambra Avenue in Monterey Park, California. The City operates under Public Water System (PWS) Identification Number CA1910092.

The City of Monterey Park was incorporated in May 1916. It is located seven miles east of the City of Los Angeles in the western portion of the San Gabriel Valley in Los Angeles County. Its water system consists of 12 wells, approximately 135 miles of water mains, 10 storage reservoirs, 2 settling tanks and 11 booster stations.

As of January 1, 2008, there were 13,244 service connections serving a population of about 64,000 people. Following is a breakdown of the City's service connections by customer type:

1. Residential – 12,242 service connections
2. Commercial and Industrial – 873 service connections
3. Agricultural – 51 service connections
4. Other – 78 service connections

The City has numerous critical customers who are reliant on the City's water for day-to-day operations. The City's critical customers are prioritized below:

1. Two hospitals/medical centers
2. Two dialysis centers
3. 13 elementary/junior high/high schools
4. 17 day care facilities
5. Two convalescent homes

The City currently obtains all of its water from the Main San Gabriel Basin using its own wells and an interconnection with the San Gabriel Valley Water Company (SGVWC), which is also exclusively from the Main San Gabriel Basin. The City also has an interconnection with the Metropolitan Water District of Southern California (MWD) and two interconnections with California Water Services Company (CWSC). Water from MWD and CWSC may be used to supplement the supply of water to customers under emergency conditions.

The City currently owns 12 wells (Wells 1, 3, 5, 6, 7, 8, 9, 10, 12, 14, 15 and Fern). See Appendix K, Plate 1 Production Wells and Facilities Location Map, and Appendix K Exhibit 3, CMP Water Division Location Addresses. The wells are generally located south of Garvey Avenue, north of Graves Avenue, east of San Gabriel Boulevard and west of Muscatel Avenue. Currently, only Wells 1,3,5,7,9,10,12,15,and Fern are in operation. The other wells are currently on standby status. The wells are due for redevelopment in the very near future due to age and new pumping characteristics that have developed as a result of the implementation of the treatment plants. The wells were drilled between 1904 and 2003 to depths ranging from 410 to 1,548 feet below ground surface (bgs), with maximum pumping capacities of about 530 to 2,350 gallons per minute (gpm). The screened intervals of the wells range from 150 to 1,548 feet bgs.

The City has a treatment train that consists of an air stripper to remove volatile organic compounds (VOCs), ion exchange unit to remove perchlorate and liquid-phase granular activated carbon (LGAC) unit to further remove VOCs. The air stripper is located at Well 12 and treats water from Well 12 ,extraction Well #15 and Well 9, when needed, the ion exchange and LGAC is located at the Delta Plant and have a capacity of 4,500 gpm. The City also has a LGAC unit at Well 5 to remove VOCs with a capacity of 1,600 gpm. A distribution system schematic is presented as Appendix K Figure 1-1.

Water from Wells 1, 3 10 and Fern undergo treatment in LGAC vessels, then flow into the Delta Plant settling tanks. Water from Wells 9, 12, and, Well 15 pass through the air strippers, ion exchange and LGAC vessels before reaching the settling tanks. From the Delta Plant settling tanks, the water is chlorinated, pumped through the Delta Booster Station, and then boosted to either Pressure Zone 1 or 2. After treatment by the LGAC vessels, water from Well 5 is chlorinated and pumped directly into Pressure Zone 2. Water from Wells 6 and 14 is chlorinated and pumped directly into Pressure Zone 1. Water from all other wells pump directly into the Delta Plant settling tanks and is chlorinated before being boosted into the distribution system.

Pressure Zone 1 is served by La Loma Reservoirs 5 and 5A, which have a combined storage capacity of 4.00 million gallons (MG) and receive water from the Delta Plant and from Wells 6 and 14. Wells 6 and 14 are currently off line due to contamination issues. The La Loma Booster Station sends water from Pressure Zone 1 to Pressure Zone 2.

Pressure Zones 2, 2A and 2B are served by the Pinetree 8, Bradshawe 3 and 3A and Russell 1A, 2 and 2A Reservoirs, which have a combined capacity of 11 MG and receive water from the Delta Plant. The Ackley, Bradshawe, Country and Russell Booster Stations send water from Pressure Zone 2 to Pressure Zone 2A. The Brightwood Booster Station sends water from Pressure Zone 2 to Pressure Zone 3. The Kingsford Booster Station sends water from Pressure Zone 2 to Pressure Zone 4. The Vagabond Booster Station sends water from Pressure Zone 2 to Pressure Zone 5.

Pressure Zone 3 is served by the Highland Reservoirs 6 and 6A, which have a combined capacity of 2.00 MG. Pressure Zones 4, 4A and 4B are served by the Sequoia 4A reservoir, which has a capacity of 1.57 MG. The Sequoia booster station supplies water to Pressure Zone 4A from Pressure Zone 4. Pressure Zones 5 and 5A are served by the Sombrero 7 Reservoir, which has a capacity of 1.57 MG. The Sombrero booster station sends water to Pressure Zone 5A from Pressure Zone 5.

In the maximum month, the City delivers approximately 350 MG. The average maximum water demand delivery rate is approximately 12 million gallons per day (mgd). In the minimum month, the City delivers approximately 220 MG. The average minimum water demand delivery rate is approximately 7.3 mgd.

Water flows through cast iron, ductile iron and asbestos cement pipelines constructed between 1922 and present-day, with diameters ranging from 2 inches to 24 inches. The pipes are buried approximately 4.5 to 10 feet deep and run under bridge crossings and over the Alhambra Wash. There are approximately 15 feet of exposed pipeline at each wellhead and approximately 5 feet of exposed pipeline at each reservoir. Table 1.1 summarizes the City's pipes.

Table 1.1 – Pipe Description

Pipe Diameter (in)	Length of Pipe (ft)
2	4,500
4	83,300
5	1,500
6	222,500
8	183,400
10	54,600
12	80,600
14	7,300
16	12,500
18	43,200
20	1,100
24	17,300

The City stores two forms of chlorine, used for disinfection. Three 150-gallon cylinders of chlorine gas and one 500-gallon tank of liquid chlorine are stored in a locked building at the Delta Plant.

The City has an 18-inch interconnection with MWD, a 10-inch interconnection with SGVWC and two 8-inch interconnections to CWSC. The interconnection with MWD has a capacity of approximately 7,000 gpm while the interconnection with SGVWC has a capacity of 5,000 gpm. The two CWSC interconnections are two-way connections, each with capacities of 1,000 gpm. The City is currently using water from the SGVWC interconnection while the MWD and CWSC interconnections provide an emergency source of water to the City.

The City is currently transitioning from an older Supervisory Control and Data Acquisition (SCADA) system to a newer system. The older Paragon-based system consists of a central computer, remote input/output modules and spread spectrum radios. The remote input/output modules are located at the booster stations. The newer Wonderware-based system consists of a central computer, programmable logic controllers (PLCs) and spread spectrum radios. The PLCs are located at the wells and booster stations. During the transition stage, both SCADA systems monitor pressures, water levels, flow rates for all equipment including booster pumps and valves. The systems also monitor alarms for pressures, water levels, flow rates and equipment failures. The SCADA systems are located at the Delta Plant in the City of Rosemead in a building that is locked and alarmed. There is also video surveillance on the premises with future plans to upgrade the security system to help increase the security of the facility.. The SCADA system may be accessed by water production personnel only through the use of individual user names and passwords.

The City's employees include the management section, the water production section, the customer service section and the water distribution section. The management section consists of the water utility manager, management analyst, a part-time secretary and a part-time draft person. The water production section consists of the production supervisor, senior pump operator, electrician, three operators and a part-time building trades technician. The customer service section consists of the customer service supervisor, cross connection inspector and two customer service technicians. The water distribution section consists of the distribution supervisor, distribution crew supervisor, three distribution operators and three maintenance workers.

Why is Water Vulnerability a threat to the City of Monterey Park?

Vulnerability Assessment

Local water supply systems and delivery pipelines can be damaged in any earthquake. While water supplies in reservoirs may exist, damage to delivery systems will impact upon the ready availability of water at normal outlet. Water delivery by tanker truck, water trailers, bottles or cans will be necessary. Central water points will have to be established for the accommodation of the population. Distribution to institutions (hospitals, convalescent centers, mass care shelters and mass feeding locations may be required. See Appendix K sheet 1-2

Security Vulnerability Assessment, City of Monterey Park Public Works Department, Monterey Park, California : submitted to : The United States Environmental Protection Agency in response to The Bioterrorism Act of 2002. December 2003 Prepared by Stetson Engineers Inc. 861 Village Oaks Drive, Suite 100, Covina California 91724.

This document is strictly confidential and no parts of this document will be released to the public. It may be reviewed by the appropriate agencies at the City of Monterey Park, Department of Public Works.

Problems

- Our groundwater basins are over-drafted and our existing surface storage cannot meet future water demands, particularly in times of drought.

- The gap between water supply and demand in California is predicted to total 2.4 million acre feet during drought years and up to 6.2 million acre feet in drought years by 2020. (An acre foot is enough to meet the annual needs of between one and two households.) Six million feet is roughly triple the amount of water the Bay Area uses in a year. At the same time, growers, manufactures and businesses are demanding more reliable and better quality water.

- It can take 20 years or longer to develop and finance a supplemental water supply for new developments.

- About 894 gallons of water are needed to grow the food for the daily diet of an average person. On an annual basis, an individual's water use is about 326, 310 gallons.

Solutions - Water

Through a state/federal partnership known as CALFED, for example, some $10 billion in expanded storage, increased recycling and conservation, ecological restoration of key watersheds, and improved water distribution and conveyance has been identified that over the next few decades help meet some of these challenges. Cities are expanding wastewater treatment systems, improving water distribution infrastructure, and developing local recycling programs as well, some using funds from the CALFED program and any other available assistance that can be provided to help meet the challenges.

To offset water shortages, the state's water recycling program needs more investment. In 1998, the last year it revised its state Water Plan, the California Department of Water Resources issued a 10-year capital improvement forecast calling for more than $1.6 billion in spending to ensure delivery of clean water. In addition, a state/federal partnership known as CALFED is overseeing a vast reworking of the state's water storage and distribution system. The CALFED program as it is known foresees $10 billion in environmental and ecological restoration projects, new storage facilities, recycling programs, water transfer arrangements to help strike a balance the state's competing water needs.

The City of Monterey Park in conjunction with the Main San Gabriel Basin Water Quality Authority and the US EPA have established an operable unit SEMOU to help track and clean up the groundwater contamination. The City of Monterey Park will continue to request governmental assistance for the remediation and clean up of the groundwater basin that directly impacts the City of Monterey Park Water Supply. Monterey Park is aggressively searching for grant programs that would assist the City in developing a plan that would help address the water supply issues.

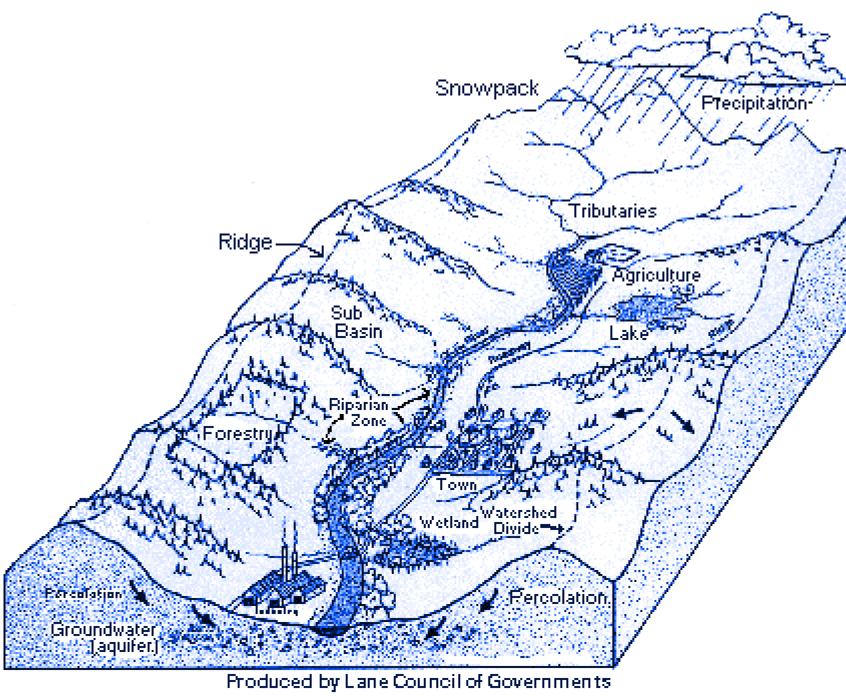
Water Sheds

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place. John Wesley Powell, scientist geographer, put it best when he said that a watershed is:

"that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."

Watersheds come in all shapes and sizes. Watersheds cross county, state, and national boundaries. No matter where you are, you're in a watershed.

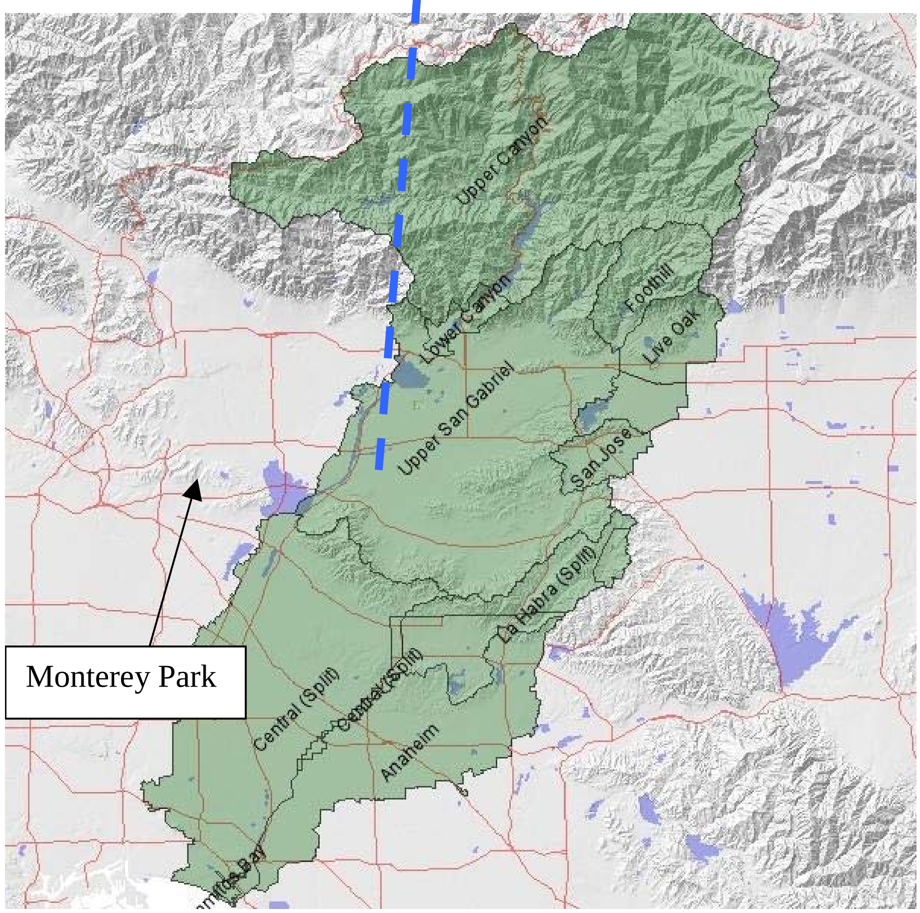
Typical Watershed



There are 6 water sheds serving Los Angeles County; Antelope-Fremont Valleys, Santa Clara, Los Angeles, San Gabriel, Santa Monica Bay, and San Pedro/Channel Islands (see map on next page). The map below shows the area of South Coast Water Sheds.

Watersheds in Los Angeles County

San Gabriel Water Shed



The Small Watershed Program in California - PL 83-566 and PL 73-534

The USDA's Small Watershed Program assists local organizations in conducting watershed surveys and investigations, and in planning and installing structural and land treatment measures for watershed protection and flood prevention. In California, the Watershed Planning and Engineering staffs are responsible for implementation of these programs.

The watershed is the unit of landscape and framework around which to think together about the land and its role in peoples' lives. The lessons learned through the implementation of PL 78-534 and PL 83-566 - the ability to work with private landowners and communities to plan and install conservation measures on a watershed scale - forms the foundation upon which locally-led conservation is built and supported by NRCS.

Background

USDA's Small Watershed Program was authorized by the Flood Control Act of 1944, Public Law 78-534, and the Watershed Protection and Flood Prevention Act of 1954, Public Law 83-566. The original program, PL 78-534, was established for 11 selected watersheds throughout the country, including the Los Angeles River and Santa Ynez River in California. The subsequent legislation, PL 83-566, was passed to expand the program to all of the nation's watersheds.

USDA's Small Watershed Program has three general purposes: 1) preventing damage from erosion, floodwater and sediment, 2) furthering the conservation development, utilization, and disposal of water, and 3) further the conservation and proper utilization of land.

The program applies to watersheds 250,000 acres and smaller. At least 20 percent of any project benefits must related directly to agriculture, including rural communities. A local sponsoring organization is needed to carry out, maintain, and operate works of improvement.

The program has two main components, each of which is funded separately: 1) watershed surveys and planning; and 2) watershed and flood prevention operations and construction.

Status of the Program in California

The Small Watershed Program in California has been used primarily for flood control, agricultural water management, and watershed protection work. There are 30 completed watershed projects in California and 15 operational projects. About 30 watersheds are currently receiving technical assistance for local planning activities.

From 1978 through 2002, over $100 million was spent in California under PL83-566 operations to install conservation measures. During this same time period, over $120 million was spent in 45 counties in California under Emergency Watershed Protection to provide emergency flood and fire repair work.

In fiscal year 2002, California received PL83-566 annual appropriations of $950,000 for watershed planning, $1,390,000 for technical assistance, and $3,351, 136 for installing practices.

Emergency Response Plans

All water systems serving a population of 3,300 or more (1,000 connections or more) must update their Emergency Response Plan (ERP) and send a completed certification form to EPA within 6 months of completing their Security Vulnerability Assessment (Security VA). All water systems are required to have an Emergency Notification Plan (ENP). In June of 2004 The City of Monterey Park Water Division submitted a complete copy of the Emergency Response Plan to the Department of Water Resources and the California Department of Public Health. See attached Appendix L, City of Monterey Park Water Utility Division Emergency Response Plan

Security Vulnerability Assessment, City of Monterey Park Public Works Department, Monterey Park, California: submitted to: The United States Environmental Protection Agency in response to The Bio-terrorism Act of 2002. December 2003 Prepared by Stetson Engineers Inc. 861 Village Oaks Drive, Suite 100, Covina California 91724.

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Ground Water

Ground water is an important component of our nation's fresh water resources. The use of ground water is of fundamental importance to human life and is also significant to economic vitality. Inventories of ground water and surface water use patterns in the United States emphasize the importance of ground water. The United States Geological Survey (USGS) compiles national water use information every 5 years and publishes a report that summarizes this information.

Groundwater is a hidden resource. At one time, its purity and availability were taken for granted. Now contamination and availability are serious issues. The following should be considered:

- Scientists estimate groundwater accounts for more than 95% of all fresh water available for use.
- Approximately 50% of Americans obtain all or part of their drinking water from groundwater.
- Nearly 95% of rural residents rely on groundwater for their drinking supply.
- About half of irrigated cropland uses groundwater.
- Using groundwater fulfills approximately one third of industrial water needs.
- About 40% of river flow nationwide (on average) depends on groundwater.

Thus, groundwater is a critical component of management plans developed by an increasing number of watershed partnerships. As a result of groundwater contamination, the City of Monterey Park has installed 5 treatment plants to remove VOC's, Nitrates, and Perchlorate.

Emerging contaminants may require future upgrades to the treatment plants to be able to provide safe drinking water to the public.

Definition

Groundwater is the water that saturates the tiny spaces between alluvial material (sand, gravel, silt, clay) or the crevices or fractures in rocks.

Aeration zone: The zone above the water table is known as the zone of aeration (unsaturated or vadose zone). Water in the soil (in the ground but above the water table) is referred to as soil moisture. Spaces between soil, gravel and rock are filled with water (suspended) and air.

Capillary water: Just above the water table, in the aeration zone, is capillary water that moves upward from the water table by capillary action. This water can move slowly in any direction, from a wet particle to a dry one. While most plants rely on moisture from precipitation that is present in the unsaturated zone, their roots may also tap into capillary water or into the underlying saturated zone.

Aquifer: Most groundwater is found in aquifers-underground layers of porous rock that are saturated from above or from structures sloping toward it. Aquifer capacity is determined by the porosity of the subsurface material and its area. Under most of the United States, there are two major types of aquifers: confined and unconfined.

Confined aquifers (also known as artesian or pressure aquifers) exist where the groundwater system is between layers of clay, dense rock or other materials with very low permeability.

Water in confined aquifers may be very old, arriving millions of years ago. It's also under more pressure than unconfined aquifers. Thus, when tapped by a well, water is forced up, sometimes above the soil surface. This is how a flowing artesian well is formed.

Unconfined aquifers are more common and do not have a low-permeability deposit above it. Water in unconfined aquifers may have arrived recently by percolating through the land surface. This is why water in unconfined aquifers is often considered very young, in geologic time. The top layer of an unconfined aquifer is the water table. It's affected by atmospheric pressure and changing hydrologic conditions. Discharge and recharge rates depend on the hydrologic conditions above them.

Saturation zone: The portion that's saturated with water is called the zone of saturation. The upper surface of this zone, open to atmospheric pressure, is known as the water table (phreatic surface).

Water-bearing rocks: Several types of rocks can hold water, including:

- Sedimentary deposits (i.e. sand and gravel)
- Channels in carbonate rocks (i.e. limestone)
- Lava tubes or cooling fractures in igneous rocks
- Fractures in hard rocks

Groundwater and Surface Water Connection

Groundwater and surface water are fundamentally interconnected. It is often difficult to separate the two because they "feed" each other. This is why one can contaminate the other.

Hydrologic (water) Cycle

- As rain or snow falls to the earth's surface:
- Some water runs off the land to rivers, lakes, streams and oceans (surface water).
- Water also can move into those bodies by percolation below ground.

Water entering the soil can infiltrate deeper to reach groundwater which can discharge to surface water or return to the surface through wells, springs and marshes. Here it becomes surface water again. And, upon evaporation, it completes the cycle. This movement of water between the earth and the atmosphere through evaporation, precipitation, infiltration and runoff is continuous.

How Groundwater "Feeds" Surface Water.

One of the most commonly used forms of groundwater comes from unconfined shallow water table aquifers. These aquifers are major sources of drinking and irrigation water. They also interact closely with streams, sometimes flowing (discharging) water into a stream or lake and sometimes receiving water from the stream or lake.

An unconfined aquifer that feeds streams is said to provide the stream's baseflow. (This is called a gaining stream.) In fact, groundwater can be responsible for maintaining the hydrologic balance of surface streams, springs, lakes, wetlands and marshes.

This is why successful watershed partnerships with a special interest in a particular stream, lake or other surface waterbody always have a special interest in the unconfined aquifer, adjacent to the water body.

How Surface Water "Feeds" Groundwater

The source of groundwater (recharge) is through precipitation or surface water that percolates downward. Approximately 5-50% (depending on climate, land use, soil type, geology and many other factors) of annual precipitation results in groundwater recharge. In some areas, streams literally recharge the aquifer through stream bed infiltration, called losing streams. Left untouched, groundwater naturally arrives at a balance, discharging and recharging depending on hydrologic conditions.

Defining Combined Boundaries

Partnerships using the watershed approach to protect natural resources identify and understand the individual resources-water, soil, air, plants, animals and people-early in the process. This is why watershed partnerships select or define boundaries to address all natural resources - not just one. They realize that groundwater, surface water, air quality, and wildlife and human activities all affect each other.

Occasionally watershed partnerships run into difficulty combining boundaries of surface water (watersheds) and recharge areas (groundwater). If this occurs, consider combining surface and groundwater into a single, larger area. In other situations-for example if water is being transferred from one watershed or aquifer to distant users-there can be, and should be, two distinct areas. Thus, watershed partnerships' boundaries may combine the wellhead area, aquifer, watershed, or many other areas depending on the issue(s).

Common Boundaries

Aquifers are often difficult to delineate. It requires someone with an understanding of the aquifer, the geology, the surface above it, and the land that drains toward the surface.

An unconfined aquifer area often extends to the surface waterbody's (i.e. lake, river, estuary) watershed. When determining an aquifer protection area, pumping (working) wells are not considered. The biggest risk to an unconfined aquifer is contaminated water moving through the permeable materials directly above it. This area is known as the primary recharge area. Depending on the depth and overlying geologic characteristics, travel time from the surface to the aquifer can be relatively short.

Less permeable deposits located at higher elevations than the aquifer form a secondary recharge area. These areas also recharge the aquifer through both overland runoff and groundwater flow. Because they are less permeable and tend to be a greater distance from the aquifer, they often filter out contaminants.

Additional recharge areas to consider include an adjacent stream that potentially contributes to the aquifer through infiltration. When pumping wells are located near a stream or lake, infiltration can be increased. Infiltrating streams typically provide an aquifer with large quantities of water and a pathway for bacteria, viruses and other contaminants.

A confined aquifer area may be limited to the outcrop of the aquifer unit and its immediate contributing area. This area may actually be isolated from the location of water supply wells within the aquifer.

Semi-confined aquifers may receive water from both outcrop areas and overlying aquifers. Delineating the aquifer protection area can be extensive and complex.

Sole-source aquifers are delineated based on aquifer type - confined, semi - confined or unconfined - and local geologic and hydrologic conditions. Defined as providing a minimum of 50% of the water for its users, sole-source aquifers usually exist only where there simply are no viable alternative water sources.

Wellhead protection areas (also known as zone of contribution and contributing areas) are the surface and subsurface areas surrounding a well or field of wells (wellfield) supplying a public water system.

The area is calculated by determining the distance contaminants are reasonably likely to move before reaching a well. Some common methods for determining the wellhead protection area include:

- Arbitrary fixed radius
- Calculated fixed radius
- Simplified variable shapes
- Analytical method
- Numerical method
- Hydro-geologic mapping

When selecting the best method, consider available funds and the level of concern. Other factors to consider include the cone of depression and drawdown.

Surface watersheds are defined by a simple process of identifying the highest elevations in land that drains to the surface waterbody (i.e. lake, pond, river, estuary, etc.). Watersheds are all shapes and sizes, ranging from just a few acres to several million acres ... many smaller watersheds "nested" inside a larger watershed.

Most successful watershed partnerships work with a manageable size yet encompass all the different, but integrated, areas. This enables faster measurable progress and stronger ties between stakeholders and the waterbody they affect.

Threats to Groundwater

An increased quantity of groundwater is being withdrawn to meet the demands of a growing population. Some of the typical threats associated with this include overdraft, drawdown and subsidence.

Overdraft occurs when groundwater is removed faster than recharge can replace it. As the case will be in the Main San Gabriel Valley Basin if MWD stoppes it groundwater replenishment program . This can result in

- A permanent loss of a portion of its storage capacity

- A change that can cause water of unusable quality contaminate good waterIn coastal basins, salt water intrusion can occur.

Generally, any withdrawal in excess of safe yield (the amount that can be withdrawn without producing an undesirable result) is an overdraft.

Drawdown differs significantly from overdraft. It results in a temporarily lowered water table generally caused by pumping. In this situation, the water table recovers when the supply is replenished.

Subsidence is one of the dramatic results from over-pumping. As the water table declines, water pressure is reduced. This causes the fine particles that held water to become compacted. In addition to permanently reducing storage capacity, the land above the aquifer can sink ... from a few inches to several feet ... causing a sinkhole. This can damage property and fields.

Inorganic compounds, pathogens and organic compounds can harm water quality, affecting the health of humans, fish and wildlife. Scientists continually learn more about contaminants, their sources and prevention practices.

Each state is responsible for designating uses for groundwater, surface waters, wetlands, etc. Designated uses include fishable, swimable, drinkable, recreational, agricultural, aquatic life, and more. Each state is also responsible for developing water quality standards for each use. For example, while most rivers are designated to be used for fishing, a few river sections are designated to be used for drinking water. The same is true for groundwater. Uses are defined and standards identified. A few groundwater uses and standards are:

- Drinking water
- Meet MCL* for pollutants
- Industrial process
- Quality & quantity criteria
- Stream base flow

- Discharge quantity & quality

*MCL: Maximum Contaminant Level

Note that, for most groundwater uses, quality and quantity are important, while for surface water uses, generally quality is the primary concern (with the realization the quantity affects quality). 100% of Monterey Park water supply is from groundwater sources.

Inorganic Compounds include all compounds that do not contain carbon. Nutrients (are nitrogen and phosphorus) and heavy metals two examples.

Nitrates can cause problems in drinking water or marine waters

- *Phosphorus* can reduce uses of fresh surface waters

- *Heavy metals* include selenium, arsenic, iron, manganese,
    - sulfur, cadmium and chromium and others. Some (iron,
    - manganese and arsenic) occur naturally

Nitrates above the MCL impact the City of Monterey Park. As a result GAC Treatment Plants had to be installed to help meet water quality goals and water demands.

Pathogens, including bacteria and viruses, have been credited with causing more than 50% of the waterborne disease outbreaks in the U.S. *Cryptosporidium Parvum* and *Giardia* both commonly cause illnesses when consumed.

Organic Compounds include Volatile Organic Compounds (VOCs) like benzene, toluene, xylene; semi-volatile compounds like naphthalene and phenol; PCBs and pesticides. The City of Monterey Park is impacted by VOC's above the MCL. As a result GAC Treatment Plants had to be installed to help meet water quality goals and water demands.

Potential Sources

Point sources are easily identified because they usually come out of a "pipe." Examples include sewage treatment plants, large injection wells, industrial plants, livestock facilities, landfills, and others. Regulated by the state water quality agency and the U.S. EPA, point sources are issued a National Pollutant Discharge Elimination System (NPDES) permit when they meet regulations.

Many point sources were established generations ago, before the threat they posed was understood. Some of these sources have been "grandfathered" into compliance with some regulations. Thus, you may find some point sources located in areas that would be considered inappropriate now.

Nonpoint sources refer to widespread, seemingly insignificant amounts of pollutants which, cumulatively, threaten water quality and natural systems. Examples of nonpoint sources include septic systems, agriculture, construction, grazing, forestry, recreational activities, careless household management, lawn care, and parking lot and other urban runoff.

Nonpoint sources are not required to have a permit. Individually, each may not be a serious threat, but together they may be a significant threat.

Other sources that aren't classified under point or nonpoint sources include underground petroleum storage systems and many large and small businesses like dry cleaners, restaurants, and automotive repair shops. Although a large number of underground storage tanks have been removed or upgraded, a significant number remain. Businesses can threaten groundwater with a wide variety of potentially contaminating substances.

Groundwater Contaminant Sources

Source	Contaminant
Salting practices & storage	Chlorides
Snow dumping	Chlorides
Agricultural fertilizers	Nitrates
Manure handling	Nitrates, pathogens
Home fertilizer	Nitrates
Septic systems	Nitrates, pathogens
Urban landscapes	Hydrocarbons, pesticides, pathogens
Agricultural dealers	Hydrocarbons, pesticides, nitrates
Agricultural feedlots	Nitrates, pathogens
Solid waste landfills	Hazardous materials
Industrial uses RCRA 'C'	Hazardous materials
Industrial uses RCRA 'D'	Hazardous materials
Small quantity generators	Hazardous materials
Households	Hazardous materials
Gas stations	Hydrocarbons
Auto repair shops	Hydrocarbons
Recycling facilities	Hydrocarbons

Auto salvage yards	Hydrocarbons
Underground storage tanks	Hydrocarbons
Industrial floor drains	Hydrocarbons
Injection wells	Hydrocarbons
Junkyards	Hydrocarbons

Mitigation

The Watershed Management Approach

A quick review of key components of the local, voluntary watershed approach to protecting natural resources will help you evaluate groundwater management approaches and how they may be used in your particular situation. The most critical component to the watershed management approach is the involvement and consensus of all key stakeholders (or organizations representing them) at each step in the process. Other key components include:

- Assess natural resources-soil, water (including groundwater), air, plants, animals, and people.
- Identify and prioritize problems.
- Develop measurable objectives-based on local environmental, economic and social goals.
- Identify and agree upon strategies for reaching objectives.
- Implement strategies and assess results.

Some of the activities, as they pertain to groundwater, are described in this guide. For example:

- Determining boundaries of the groundwater and watershed areas is typically part of assessment.
- Discussing existing and future uses of water is part of setting goals.
- Defining pollutants and sources is part of assessment, goal setting and solution identification.
- Understanding various tools is part of identifying and implementing solutions.

Existing Groundwater Programs

Over the past 20 years many federal and state programs have been developed to improve management of groundwater. Four of the most useful can also easily be incorporated into your watershed plan. These include:

- *Comprehensive State Groundwater Protection Program*
- *Sole Source Aquifer Program*
- *Source Water Protection Program*
- *Wellhead Protection Program*

These approaches can be used in a complementary fashion to manage all resources, including groundwater, for multiple uses-ranging from human consumption to industrial processes to maintaining ecological integrity within a wetland.

Comprehensive State Groundwater Protection Program is a statewide program that looks at groundwater's uses, including drinking water, and its role in sustaining the health of surface waterbodies (rivers, streams, wetlands, marshes).

The Sole Source Aquifer Program, Source Water Protection Program, and Wellhead Protection Program all are intended to protect a drinking water supply. The programs generally are compatible with the *Comprehensive State Groundwater Protection Program,* but are applied to very defined geographic areas:

- *The Sole Source Aquifer Program* applies to the aquifer boundaries.
- *The Source Water Protection Program* applies to water that drains into a reservoir (used as a drinking water source) or intake.
- *The Wellhead Protection Program* applies to defined wellhead areas.

Special Issues

Although groundwater programs are often used within the watershed framework, there are some issues that may arise as you attempt to integrate them. These issues have been listed to simply make you aware of them. Each is best addressed through cooperation and consensus. Water quality use designations often do not reflect the presence of groundwater intakes for drinking water. Water quality criteria and drinking water maximum contaminant levels (MCLs) often are not consistent in terms of chemical specific values and parameters.

Minor dischargers and permitted management measures under the NPDES program may not sufficiently reduce the risk to drinking water intakes. Where agriculture activities are reducing drinking water quality, changes in management practices may or may not take a long time to result in water quality improvements depending on weather, geography etc. Source water areas for groundwater drinking supplies (wellhead areas) generally do not coincide with surface water drainage areas. Long-term drinking water treatment may be necessary for certain public water supply systems because of the nature of the contaminant sources and the size of the contributing area.

Mitigation & Management Tools

There are many, many tools that can be used to manage groundwater resources:

Zoning: Regulations are used to segregate different, and possibly conflicting, activities into different areas of a community. This approach can be limited in its ability to protect groundwater due to "grandfather" provisions.

Overlay Water Resource Protection Districts: Similar to zoning regulations in their goals of defining the resource, these ordinances and bylaws map zones of contributing boundaries and enact specific legislation for land uses and development within these boundaries.

Prohibition of Some Land Uses: These are not typically considered very creative tools. However, prohibition of land uses such as gas stations, sewage treatment plants, landfills, or the use/storage/transport of toxic materials is a first step towards the development of a comprehensive groundwater protection strategy.

Special Permitting: The special permitting process can be used to regulate uses and structures that may potentially degrade water and land quality.

Large Lot Zoning: Large lot zoning seeks to limit groundwater resource degradation by reducing the number of buildings and septic systems within a groundwater protection area.

Eliminating/Modifying Septic Systems: Septic system problems can be reduced or eliminated by extending or developing community sewage treatment systems. Other options include specifying minimum design requirements like mound systems.

Transfer of Development Rights: A government entity prepares a plan designating land parcels from which development rights can be transferred to other areas. This allows land uses to be protected (i.e. for a gas station) while assuring that these uses are outside sensitive areas.

Growth Control/Timing: Growth controls are used to slow or guide a community's growth, ideally in concert with its ability to support growth. One important consideration is the availability of groundwater.

Performance Standards: This assumes that any given resource has a threshold, beyond which it deteriorates to an unacceptable level. Performance standards assume that most uses are allowable in a designated area, provided that the use or uses do not and will not overload the resource. With performance standards, it is important to establish critical threshold limits as the bottom line for acceptability.

Underground Storage Tanks: Three additional protection measures are often adopted to enhance local water resource protection. They include:

- Prohibit new residential underground storage tanks
- Remove existing residential underground storage tanks
- Prohibit all new underground storage tank installation in groundwater and surface water management areas

Septic System Maintenance: Septic system maintenance is frequently overlooked. Many times the system will not function properly, causing "breakout" of solids at the surface, which can lead to bacterial contamination. In addition, when systems fail, any additives used can become contaminants.

Land Donations: Land owners are often in the position of being able to donate some land to the community or to a local land trust.

Conservation Easements: Conservation easements allow for a limited right to use the land. Easements can effectively protect critical lands from development.

Purchase Lands: Many communities purchase selected parcels of land that are deemed significant for resource protection.

Well Construction/Closure Standards: Wells are a direct conduit to groundwater. Standards for new well construction, as well as identification and closure of abandoned wells, can prevent groundwater from being contaminated.

Groundwater Protection Tools

Technique	Tool
Zoning Districts	Overlay Groundwater Protection
Prohibit Various Land Uses	Special Permitting
Large Lot Zoning	Transfer of Development Rights
Cluster/PUD Design	Growth Controls/Timing
Performance Standards	Geographic Information Systems
Overlay Wetlands	Identify Local Wellhead Protection Areas
Subdivision Control	Drainage Requirements
Growth Management in Sensitive Areas	Health Regulations
Underground Fuel Storage Systems	Small Sewage Treatment Plants
Septic Cleaner Bans	Septic System Upgrades
Toxic & Hazardous Material Regulations	Private Well Protection
Voluntary Restrictions	Sale, Donation or Trust
Conservation Easements	Limited Development
Other non-regulatory	Monitoring
Contingency Plans Hazardous Waste	
Collection Public Education Land Banking	

Groundwater Management Practices

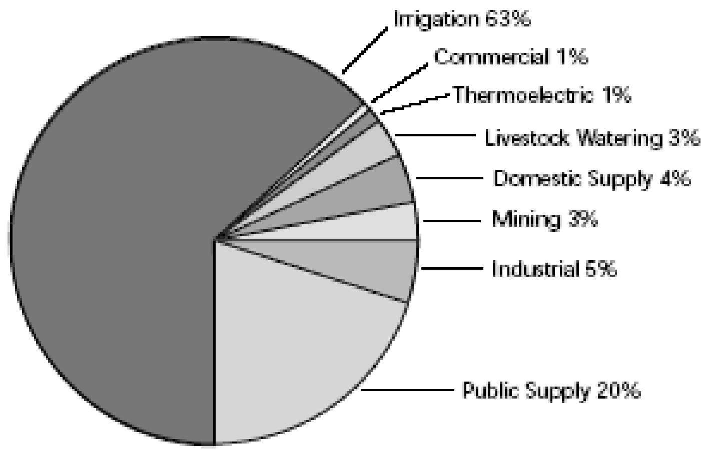
Zoning Districts	Practices
Groundwater recharge	Impervious area restriction
Artificial wetlands	Grass lined channels
Impoundment structures (ponds)	Subsurface drains (tiles)
Infiltration trenches	Native tree and shrub plantings
Pollutant reduction	Buffer strips
Filter strips	Riparian zones
Pollution prevention	Soil nitrate testing
Integrated pest management	Manure testing
Variable rate applications	Abandoned well closure

The latest USGS report was issued in October 1998 for the 1995 water year. The USGS report shows that ground water provides water for drinking and bathing, irrigation of crop lands, livestock watering, mining, industrial and commercial uses, and thermoelectric cooling applications.

Figure 1 illustrates how ground water use is proportioned among these categories. As shown, irrigation (63%) and public water supply (20%) are the largest uses of ground water. About 77,500 million gallons of ground water are withdrawn daily.

Figure 1

National Ground Water Use



Source: *Estimated Use of Water in the United States in 1995.*
U.S. Geological Survey Circular 1200, 1998.

In 1995, the USGS reported that groundwater supplied 46% of the nation's overall population and 99% of the population in rural areas with drinking water. Our nation's dependence on this valuable resource is clear.

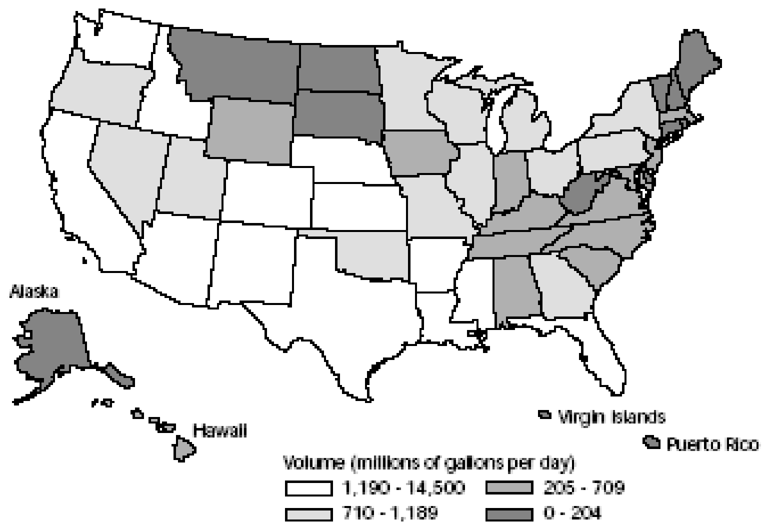
Every state uses some amount of ground water. Nineteen states obtain more than 25% of their overall water supply from ground water. Ten states obtain more than 50% of their total water supply from ground water. 100% of Monterey Park's water supply is from groundwater sources.

Each state uses its ground water differently. Ground water use in individual states is a result of numerous interrelated factors generally associated with geography and climate, the principal types of business activities occurring in the state, and population distribution. Fresh ground water withdrawals during 1995 were highest generally in the western states, primarily to supply an increasing population and to sustain important agricultural activities.

Figure 2 shows the volume of ground water withdrawn by states. The 13 states that have the greatest withdrawals account for 69% of all ground water that is withdrawn nationally.

Figure 2

Ground Water Withdrawals by State in 1995



Source: *Estimated Use of Water in the United States in 1995.*
U.S. Geological Survey Circular 1200, 1998.

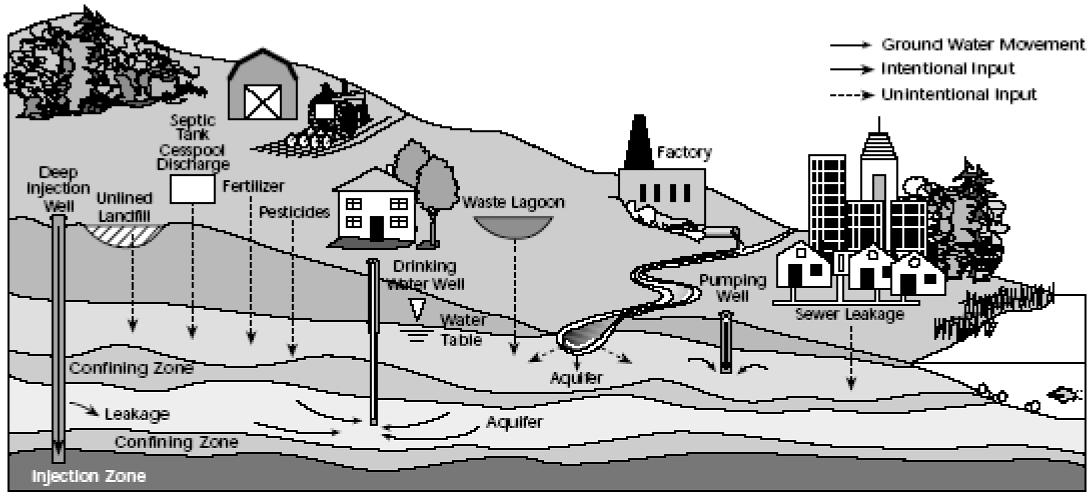
Sources of Ground Water Contamination

Ground water quality may be adversely impacted by a variety of potential contaminant sources. It can be difficult to identify which sources have the greatest impact on ground water quality because each source varies in the amount of ground water it contaminates. In addition, each source impacts water quality differently.

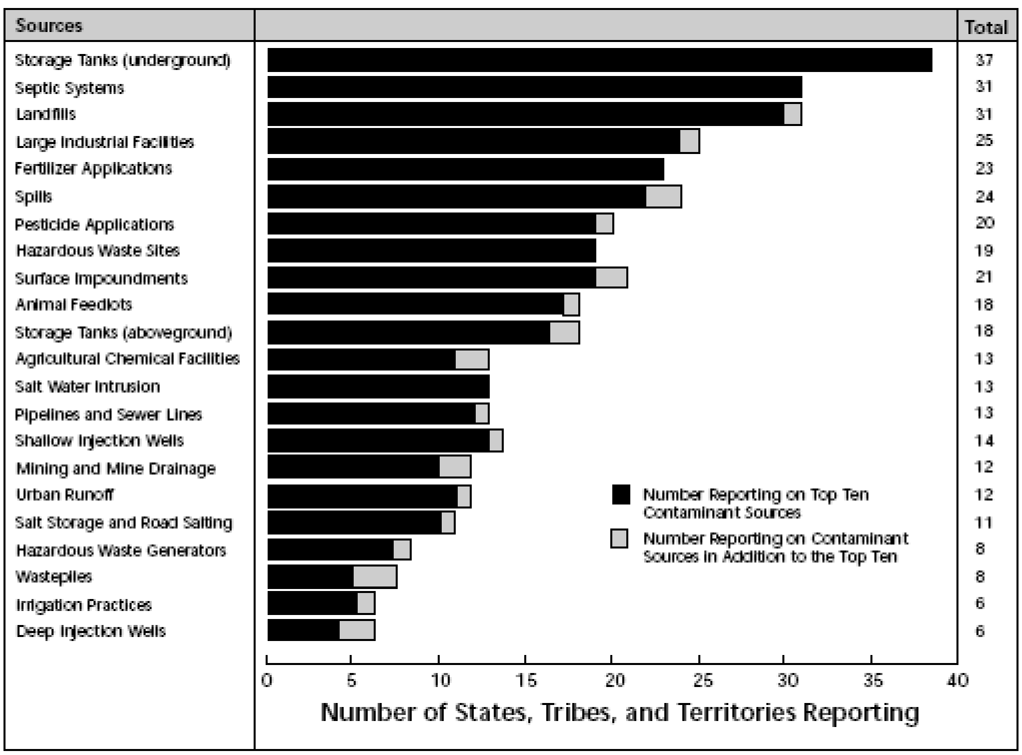
An EPA/state workgroup developed a list of potential contaminant sources and requested each state to indicate the 10 top sources that potentially threaten their ground water resources. States added sources as was necessary based on state-specific concerns. When selecting sources, states considered numerous factors, including the number of each type of contaminant source in the state. Monterey Park is part of the EPA South El Monte Operable Unit established to help address the contamination issues Monterey Park faces.

- The location relative to ground water sources used for drinking water purposes
- The size of the population at risk from contaminated drinking water
- The risk posed to human health and/or the environment from releases
- Hydrogeologic sensitivity (the ease with which contaminants enter and travel through soil and reach aquifers)
- The findings of the state's ground water assessments and/or related studies.

Sources of Ground Water Contamination



Major Sources of Ground Water Contamination



EPA, "National Water Quality Inventory"

Methyl Tertiary Butyl Ether (MTBE)

Senate Bill 521 was introduced February 24, 1997 in response to a growing awareness of the possible environmental and health effects associated with the use of Methyl Tertiary Butyl Ether (MTBE) as an oxygenate blending agent in gasoline fuels throughout California (Appendix A). Since 1979, MTBE had been used in the State as a replacement for tetraethyl lead and as an octane booster. Although used in California since 1979 in volumes ranging from 0.5 to 3.5 percent, the volumes of MTBE in gasoline have increased to 11 percent since 1996. SB 521, which became effective January 1, 1998, called for the University of California to perform an assessment of the benefits and risks associated with the uses of MTBE in California.

This assessment report addresses: 1) the current impacts of MTBE to the state's groundwater used for drinking; 2) risks to the state's groundwater resources associated with MTBE leaking from storage tanks and other petroleum storage and conveyance facilities; and 3) potential future risks to the state's groundwater should MTBE continued to be used.

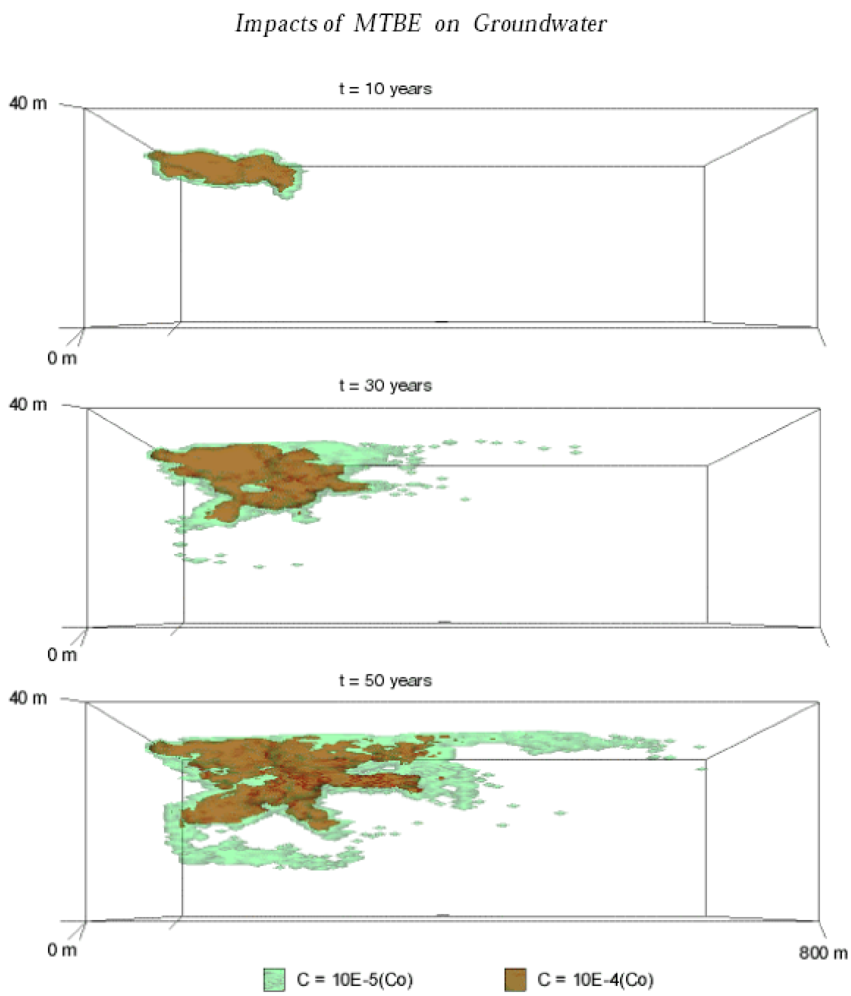
The general approach was to compile statewide data on the occurrence of MTBE groundwater contamination. The data consisted of MTBE detections and concentrations at leaking underground storage tank sites from Regional Water Quality Control Boards and MTBE detections and concentrations in water supply wells based on information from the Department of Health Services, Local Primacy Agencies, and Regional Water Quality Control Boards. We used various modeling approaches to then assess potential future impacts of MTBE on groundwater resources, focusing primarily on plume behavior in aquifer systems consisting of alluvial materials (i.e., sand, gravel, silt and clay). This report also includes specific information on MTBE impacts on groundwater in the Tahoe Basin.

A recent investigation into the impacts of MTBE on California groundwater by Happel et al. (1998) provided an important foundation for this study. The analysis of groundwater impacts contained herein complements the work of Happel et al. (1998) by accumulating more recent statewide information with broader geographic coverage. Moreover, we use plume length statistics compiled by Happel et al. (1998) as a basis for calibrating models that simulate future MTBE plume growth.

The use of MTBE in gasoline has increased steadily since it was first approved for use in gasoline by the United States Environmental Protection Agency (USEPA) in 1979. MTBE is produced from isobutene, a waste product of the petroleum refining process. In 1994, MTBE was ranked as the eighteenth most produced chemical in the United States. By 1995 it was ranked twelfth, and by 1997 it was ranked second (OEHHA, 1998). MTBE was used in California's lead phase out program in 1979 at volumes up to 2 percent as a lead substitute and octane booster.

The US EPA approved use of MTBE in 1981 up to 10 percent and in 1988 approved its use up to 15 percent by volume (CAEPA, 1998). As early as 1988, MTBE use in southern California had begun to increase. In 1988, a refiner introduced an environmentally clean fuel in California that included 6 to 8 percent MTBE by volume. This refiner reportedly supplied 30 percent of the fuel in California of which approximately 20 percent of this refiner's sales was the environmentally clean fuel. This fuel was sold principally in southern California (D. Simeroth, personal communication, 1998).

The complete phase out of lead in fuel occurred in 1992, at which time the Winter Time Oxygenate Program began in California. There was an increased use of MTBE in the southern part of the state, with longer wintertime intervals and an earlier commencement of the year-round oxygenate program starting in 1995 rather than 1996. After March 1, 1996, all gasoline sold in California was Phase 2 reformulated gas containing 11 percent by volume MTBE. Approximately, 92 billion gallons of MTBE was produced in 1997 (Zogorski et al., 1998). California is reportedly the third largest worldwide consumer of MTBE, second only to the rest of the United States and the former Soviet Union (OEHHA, 1998).



3-D simulated MTBE plume snap shots at (top to bottom) 10, 30, and 50 yr. Total thickness of the box is 40.5 m, and total length is 810 m. Regional flow is left to right. Screened interval of the pumping well is located in the center of the domain at a depth of 20 m.

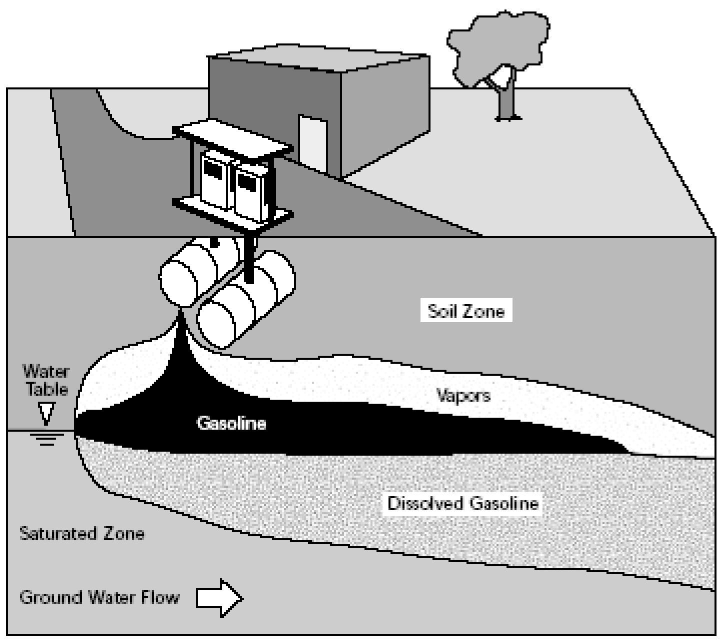
University of California at Davis; “Impacts of MTBE on California Groundwater”

Sources of MTBE in Groundwater

MTBE sources of groundwater contamination include leaking underground fuel tanks (LUFT's), above ground storage tanks, farm tanks, leaking petroleum fuel pipelines, underground storage tanks containing fuels other than gasoline, surface spills due to automobile or tanker truck accidents, surface spills due to abandoned or parked vehicles, MTBE contaminated surface water, and precipitation. The LUFT sites are numerous, widely dispersed, proportional to the state's population, and involve enormous volumes of fuel products. As of June 30, 1998 there were 32,779 known sites where chemical compounds, including gasoline and non-gasoline products, were discharged to the environment from underground storage tanks. Ninety percent of these discharges involve petroleum products.

University of California at Davis; "Impacts of MTBE on California Groundwater"

Ground Water Contamination as a Result of Leaking Underground Storage Tanks



Ground Water Protection

The responsibility for ground water protection collectively belongs to government agencies at the federal, state, and local levels. Federal and state governments regulate ground water through laws, regulations, and policies. In many cases, state and local laws are stricter versions of federal legislation, which serves as a valuable baseline on which state and local laws can build.

At the federal level, the Clean Water Act (CWA) ensures protection of surface waters designated, in part, for use as drinking water. Other environmental laws—the Safe Drinking Water Act (SDWA) (which includes the Wellhead Protection [WHP] Program, the Sole

Source Aquifer [SSA] Program, and the Underground Injection Program); the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)—provide authorities, financial support, and technical assistance to protect sources of drinking water, especially ground water.

EPA is developing a regulation on ground water that specifies the appropriate use of disinfection and addresses other components of ground water systems to ensure public health protection. Various studies seem to indicate that the number of ground water sources with evidence of fecal contamination is significant. EPA is analyzing the data to determine if they represent public wells nationally. The proposed rule also encourages the use of alternative approaches, including best management practices and source control.

Drought

Unlike weather forecasting, Climatologists deal with years. One 6-inch rainstorm out of nowhere could make these predictions for this year look foolish in your area. Therefore you will have drought forecasts tempered with, "indications are" "likely" and "overdue".

Definition of Drought

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

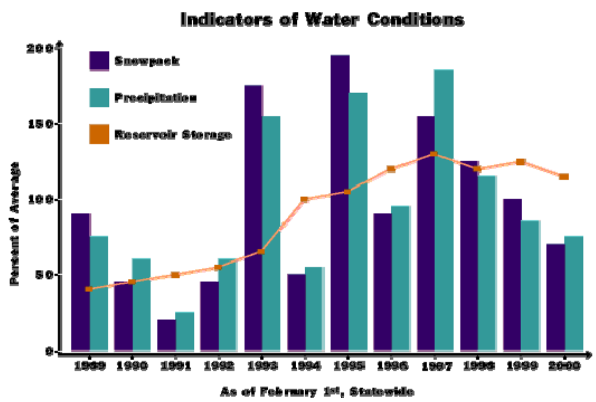
Concept of Drought

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

A five-year drought has parched soils, lowered reservoirs and weakened forests. And if the past is any guide, the dry spell could go on for decades.

One dry year does not normally constitute a drought in California, but serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure -- its reservoirs, groundwater basins, and inter-regional conveyance facilities -- mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. The City of Monterey Park has included the a copy of the Urban Water Management Plan as appendix K for further reference regarding Water Drought and Conservation efforts the City will be encountering if such severe weather conditions persist. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

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



Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multiyear period. There is no universal definition of when a drought begins or ends. Impacts of drought are typically felt first by those most reliant on annual rainfall -- ranchers engaged in dry land grazing, rural residents relying on wells in low-yield rock formations, or small water systems lacking a reliable source. Criteria used to identify statewide drought conditions do not address these localized impacts. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

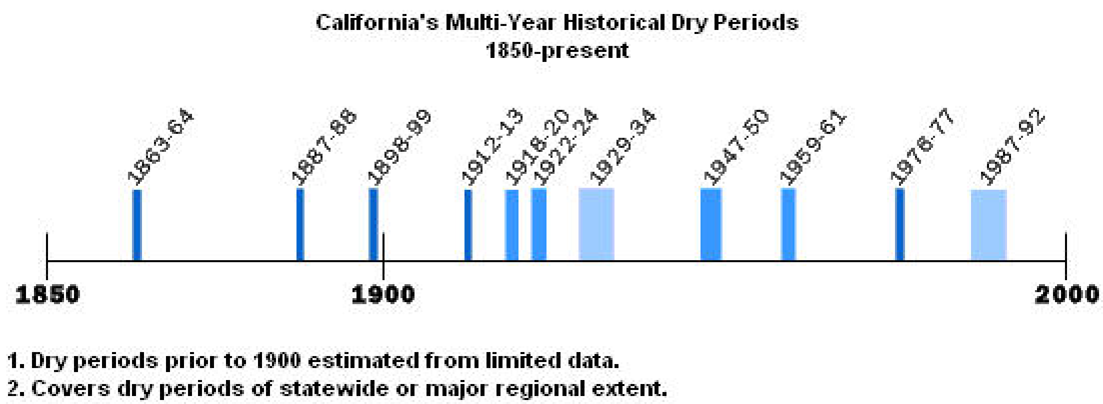
Past California Droughts

Droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large Northern California reservoirs. The table below compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77 and 1987-92 droughts. The driest single year of California's measured hydrologic record was 1977. California's most recent multi-year drought was 1987-92.

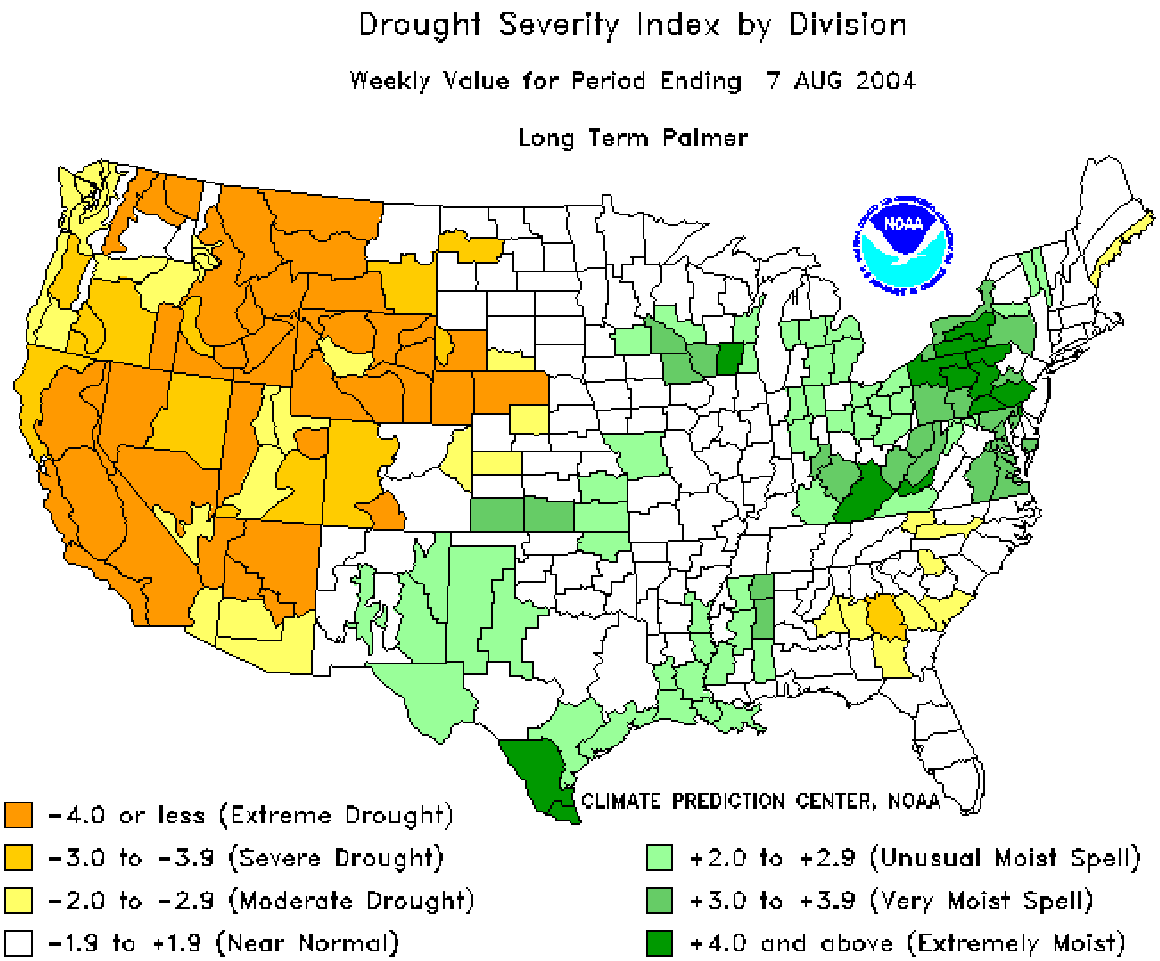
Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

Drought	Sacramento Valley Runoff		San Joaquin Valley Runoff	
Period	(maf/yr)	(% Average 1901-96)	(maf/yr)	(% Average 1906-96)
1929-34	9.8	55	3.3	57
1976-77	6.6	37	1.5	26
1987-92	10.0	56	2.8	47

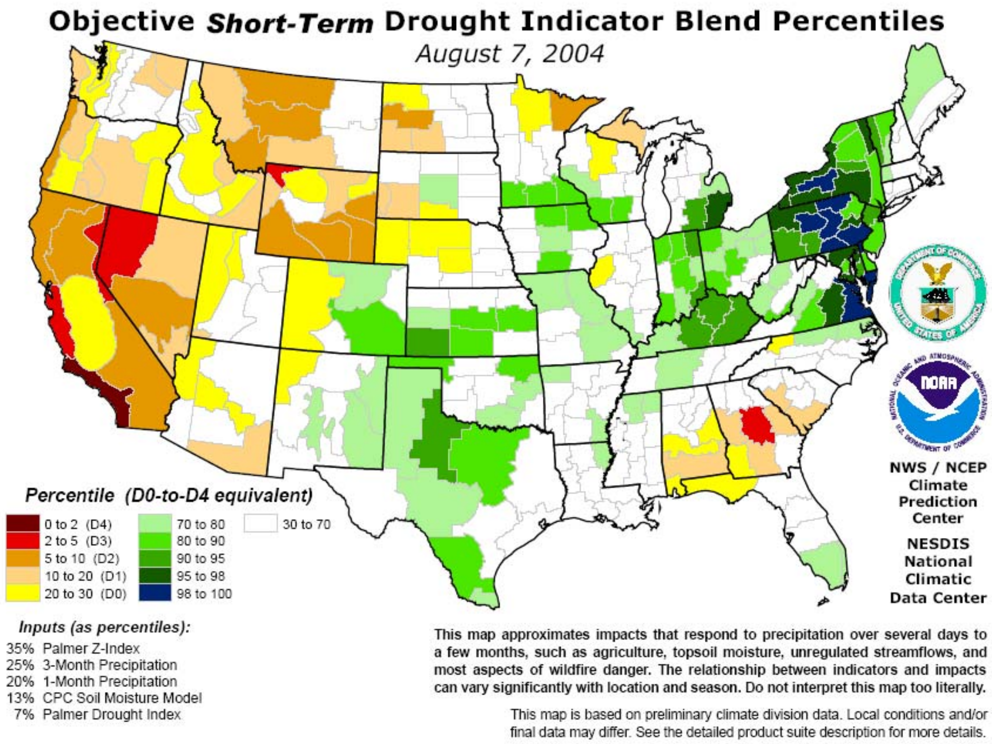
Measured hydrologic data for droughts prior to 1900 are minimal. Multi-year dry periods in the second half of the 19th century can be qualitatively identified from the limited records available combined with historical accounts, as illustrated in the figure below, but the severity of the dry periods cannot be directly quantified.

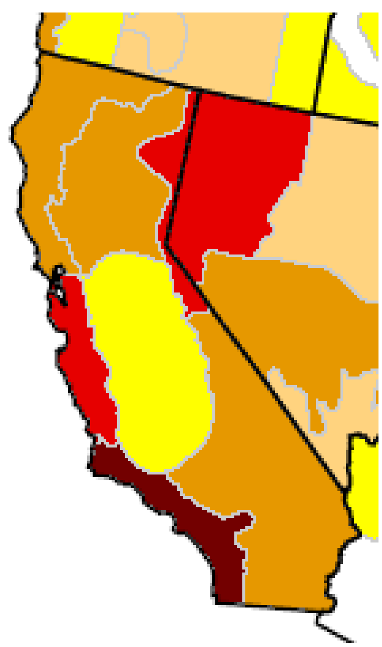


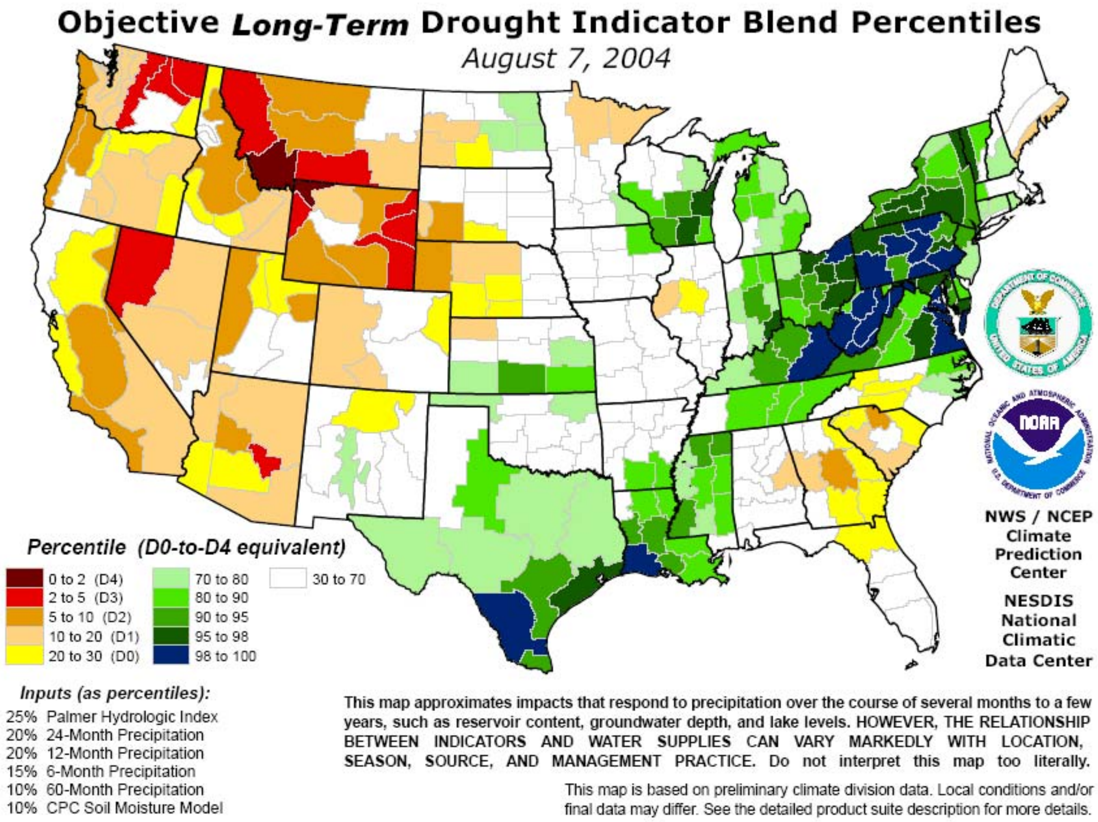
One approach to supplementing California's limited period of measured data is to statistically reconstruct data through the study of tree rings (called dendrochronology). Information on the thickness of annual growth rings can be used to infer the wetness of the season. Site-specific approaches to supplementing the historical record can include age-dating dryland plant remains now submerged in place by rising water levels, or sediment and pollen studies. For example, a 1994 study of relict tree stumps rooted in present-day lakes, rivers, and marshes suggested that California sustained two epic drought periods, extending over more than three centuries. The first epic drought lasted more than two centuries before the year 1112; the second drought lasted more than 140 years before 1350. In this study, the researcher used drowned tree stumps rooted in Mono Lake, Tenaya Lake, West Walker River, and Osgood Swamp in the central Sierra Nevada. These investigations indicate that California has been subject to droughts more severe and more prolonged than those witnessed in the brief historical record.

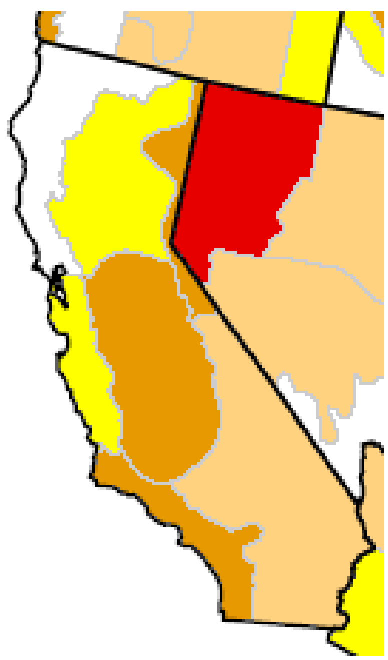


Drought Monitor






Objective Long-Term Drought Indicator Blend Percentiles
August 7, 2004
Percentile (D0-to-D4 equivalent)
0 to 2 (D4)
2 to 5 (D3)
5 to 10 (D2)
10 to 20 (D1)
20 to 30 (D0)
70 to 80
80 to 90
90 to 95
95 to 98
98 to 100
30 to 70
NWS / NCEP
Climate
Prediction
Center
NESDIS
National
Climatic
Data Center
Inputs (as percentiles):
25% Palmer Hydrologic Index
20% 24-Month Precipitation
20% 12-Month Precipitation
15% 6-Month Precipitation
10% 60-Month Precipitation
10% CPC Soil Moisture Model
This map approximates impacts that respond to precipitation over the course of several months to a few years, such as reservoir content, groundwater depth, and lake levels. HOWEVER, THE RELATIONSHIP BETWEEN INDICATORS AND WATER SUPPLIES CAN VARY MARKEDLY WITH LOCATION, SEASON, SOURCE, AND MANAGEMENT PRACTICE. Do not interpret this map too literally.
This map is based on preliminary climate division data. Local conditions and/or final data may differ. See the detailed product suite description for more details.



The Drought Monitor was introduced as an operational weekly product in 1999 to provide an overview of conditions averaged across a broad array of time scales and impact indicators, leaning toward those that seem most relevant to observed impacts. This approach has led to an unprecedented degree of cooperation and coordination among a variety of disparate Federal, state, and local government agencies, in addition to many interested members of the academic and private research communities. The result has boiled the complex issues of drought and drought-related impact assessment down to a single, simple, visually-intuitive summary of conditions which has replaced the uncoordinated, disparate, and often contradictory assortment of opinions and data that formerly characterized responses to requests for drought information.

Water Mitigation Items Including Drought

The City of Monterey Park drought mitigation action items provide direction and specific activities that the City, organizations, and residents in the City of Monterey Park can undertake to reduce the risk and prevent the impact a drought or other supply issues and /or condition that may have an impact on the residents and or water operations within the City of Monterey Park. The UWMP Act (Water Code Sections 10610 through 10656) requires that every urban water supplier provides and adopts an UWMP. The City developed and adopted an Urban Water Management Plan in 2005. Since that time the City Water Division has updated some items in the plan and are currently being discussed for future implementation and or adoption through City Council approval. The UWMP is kept on file in the offices of the Monterey Park Water Department. For complete details please refer to the enclosed proposed **City of Monterey Park 2008 Urban Water Management Plan attached as Appendix W**

The proposed 2008 Urban Water Management Plan consist of the following chapters..

Chapter 1 - Introduction

- 1.1 Urban Water Management Plan
- 1.2 Agency Coordination
- 1.3 Water Management Tools
- 1.4 Changes to the Plan

Chapter 2 - Description of service Area

- 2.1 Background
- 2.2 Description of Service Area
- 2.3 Climate
- 2.4 Current/Projected Population and Demographics Factors

Chapter 3 – Sources of Supply

- 3.1 Existing and Planned Sources of Supply
- 3.2 Groundwater Management
- 3.3 Main San Gabrile Basin Management
  - 3.3.1 Long Beach Judgment
  - 3.3.2 Main Basin Judgment
  - 3.3.3 Operations of the Main Basin Groundwater Basin
  - 3.3.4 Five –Year Water Quality and Supply Plan
- 3.4 Description of Groundwater Basin

The UWMP identifies the Short Term and Long Term mitigation strategies during such an event.

In summary, the UWMP listed above pinpoints action items with directions on specific activities that the City, organizations and or residents of Monterey Park can undertake and or implement to reduce the risk and prevent the loss of services in the event of a major water issue. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers pursuing strategies for implementation

Water Vulnerability Mitigation Action Items

The windstorm mitigation action items provide direction on specific activities that organizations and residents in the City of Monterey Park can undertake to reduce risk and prevent loss from windstorm events. Each action item is followed by ideas for implementation, which can be used by the Hazard Mitigation Planning Committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

Short Term – Water Drought

Improve knowledge of water drought issues and understanding of vulnerability and risk to life and property with in the City of Monterey Park

Ideas for improving

Expand the community outreach educational program.
Broadcast on Channel 55 more water related issues.
Educated other City Department in Water Conservation Efforts and Ideas

> Example…Park and Rec Department minimize watering schedules for parks and medians. Retrofit existing pool facilities to help conserve water.

Coordinating Organization	Hazard Mitigation Advisory Committee
Timeline	1-2 Years
Plan Goals Addressed	Protect water resources to help protect Life and Property
Constraints	Water resources due to contamination and or funding availability.

Infrastructural Improvements

Enhance the City's storage capacity by adding reservoir(s) to the system.

Coordinating Organization	Public Works Department
Timeline	1-2 Years
Plan Goals Addressed	Add 3-4 million gallons of water to storage capacity.

Constraints	Available hillside space and capital funding availability.

Improve water quality and add water source to the system by building an air stripper.

Coordinating Organization	Public Works Department
Timeline	1-2 Years
Plan Goals Addressed	Remove water contamination effectively while adding an out-of-service well back into service, adding up to 600 GPM to the system.
Constraints	Funding sources, changing levels of contamination and CDPH permit approval.

Long Term

Review Local ordinances regarding water shortages and conservation water usage.

Ideas for Implementation

Create committee of local stakeholders to study issues and make recommendations to staff and or council.

Coordinating Organizations	Public Works Staff and City Manager
Timeline	1-3 years
Plan Goals Addressed	Protect water resources to help protect Life and Property
Constraints	Water resources due to contamination and or funding availability.

Infrastructural Improvements

Replace and upgrade approximately 15,600 linear feet old and undersized mainlines in the distribution system.

Coordinating Organizations	Public Works Department
Timeline	5 years
Plan Goals Addressed	Increases reliability of the distribution system, improves fire protection capacity and minimizes water loss.
Constraints	Funding availability

Create a pilot program for Automated Meter Read (AMR) in the distribution system

Coordinating Organizations	Public Works Staff and City Manager
Timeline	5-6 years
Plan Goals Addressed	Replaces aging meters with potentially more accurate meters that download reads to a central

	location, report leaks and improve our ability to track water usage/loss.
Constraints	Funding availability, probable technological glitches, evaluation and installation will be time consuming.

Wastewater Disruption

Problems

- The City of Monterey Park relies on water mains and sewers that are more than 100 years old.

- In 2001 California officials issued more than 2,000 beach closings and health advisories because of old infustructure systems causing sewer spills and overflows. Spills and overflows typically happen because wastewater systems have not been upgraded to facilitate new growth, and sewer pipes have not been replaced in time to avert a main break.

- When it rains, at times as little as one-quarter inch, the volume of combined runoff and wastewater becomes too great for sewage treatment plants to handle, and the flow is diverted to outfall points that discharge raw sewage, toxic industrial waste and floatables such as garbage and syringes.

- California needs an estimated $8.4 billion for local wastewater treatment improvements.

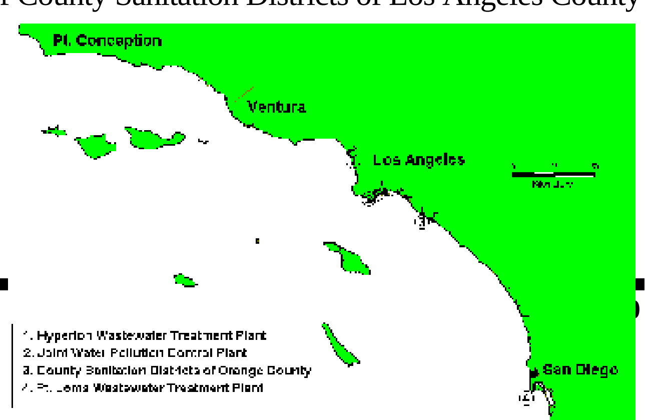
Solutions - Wastewater

State and federal water quality regulations require cities and other municipalities to upgrade wastewater treatment and distribution systems to prevent overflows during wet weather no later than 2014. Pipe replacement projects, construction of new retention ponds, increased recycling and conservation programs, and expanded treatment facilities are all part of the mix of solutions.

California Dept. of Water Resources, Water Education Foundation, Natural Resources Defense Council

Characteristics Of Effluents From Large Municipal Wastewater Treatment Facilities

Effluents from the Hyperion Treatment Plant (HTP) of the City of Los Angeles, the Joint Water Pollution Control Plant (JWPCP) of County Sanitation Districts of Los Angeles County (CSDLAC), Wastewater Treatment Plants 1 and 2 of County Sanitation Districts of Orange County (CSDOC), and Point Loma Wastewater Treatment Plant (PLWTP) of the City of San Diego comprise 90% of municipal wastewater discharged directly to the



Southern California Bight. These agencies have routinely measured the characteristics of their effluents for at least two decades. Each year during this period, the Southern California Coastal Water Research Project (SCCWRP) has summarized these measurements and reported on discharge and constituent trends. In this report, we summarize the concentrations of effluent constituents and estimate the mass emissions for these four agencies for 1993; we also discuss trends in the mass emissions of contaminants from 1971 to 1993.

Inherent Danger to Waste Water Systems

CALIFORNIA WASTEWATER TREATMENT OPERATOR ADMITS TO WATER TAMPERING

FOR RELEASE: FRIDAY, APRIL 9, 1999

CALIFORNIA WASTEWATER TREATMENT OPERATOR ADMITS

TO WATER TAMPERING

Bernardino Lopez, former wastewater treatment plant operator for the Niland Sanitary District, pleaded guilty on March 29 in U.S. District Court for the Southern District of California in San Diego, to violating the Clean Water Act (CWA). Lopez admitted that in August and September of 1998, he repeatedly added chlorine to wastewater samples that were to be tested for E. coli. bacteria. The samples were used to develop monthly reports to the Regional Water Quality Control Board. Adding chlorine to the samples concealed the fact that both treatment plants were discharging wastewater with E. coli. levels that exceeded the limits allowed in their CWA National Point Discharge Elimination System permits. Human exposure to wastewater containing excessive levels of E. coli. can cause skin and intestinal infections. Wastewater from both plants flows into the Salton Sea. When sentenced, Lopez faces a maximum penalty of two years imprisonment and/or a $10,000 fine. This case was investigated by the Imperial County Environmental Task Force, which includes EPA's Criminal Investigation Division, and was prosecuted by the U.S. Department of Justice.

SECTION 12:
- Manmade Hazards–

Table of Contents

WHY ARE MANMADE HAZARDS A THREAT TO MONTEREY PARK?

Manmade hazards differ from natural hazards as they result directly from the actions of people. There are two types of identifiable manmade hazards: technological hazards and terrorism. Technological hazards, such as hazardous material spills, may result from the improper handling or transportation of toxic chemicals, infectious substances, or radioactive materials. Terrorism encompasses intentional, criminal and malicious acts involving weapons of mass destruction (deployment of biological, chemical, nuclear, and radiological weapons) and conventional weapons (use of arson, incendiary explosives, armed attacks, intentional hazardous material release, and cyber-terrorism). Some manmade hazards such as aviation disasters and explosions may fall under the technological or terrorism heading depending upon the circumstances.

Hazardous Materials:

Technological hazards involving hazardous material releases can occur at facilities (fixed site) or along transportation routes (off-site). They can occur because of human carelessness, technological failure, intentional acts (terrorism), and natural acts. Hazardous materials releases, depending on the substance involved and type of release, can directly cause injuries and death and contaminate air, water, and soils. While the probability of a hazardous materials release at either a fixed site or along local transportation corridors is relatively low, the consequences of the release of these materials are very serious.

Fixed Site Hazardous Materials Characteristics in Monterey Park:

Location	Purpose	Hazard
Garvey Reservoir	Water Purification	Chlorine Storage
Barnes Park Pool	Recreation	Chlorine Gas
Elder Park Pool	Recreation	Chlorine Gas
Private Industry Sites		
Kotura	Research Facility	Various Lethal Compounds

This list is for illustrative purposes only and should not be construed to be exhaustive.

Off-Site Hazardous Materials Characteristics in Monterey Park:

The greatest probability of a major hazardous material incident is from a transportation accident. Monterey Park has three major highways (Interstate 710; Interstate 10; and State Route 60) that surround it. All three are major transportation corridors in the greater Los Angeles and Southern California area. In addition, Garvey Avenue is a major east – west trucking route for local traffic and used as an alternate route for Interstate 10.

Atlantic Boulevard and Garfield Avenue, the two major north – south routes, are trucking routes for local traffic and used as alternate routes for Interstate 710.

A large number of the trucks that transport goods throughout the Los Angeles area pass through the area described above. A great number of them are transporting cargo along these transportation corridors that is considered hazardous material.

Historical Incidents of Hazardous Materials Release:

To date, the City of Monterey Park has been fortunate to escape the impact of a major hazardous materials release. However, there have been a number of minor incidents that are consistent with the characteristics of a community like Monterey Park.

Most hazardous materials incidents have occurred in transport corridors such as freeways and other major transport arteries. The most significant of these releases have consisted of petroleum products such as gasoline and diesel fuel. Previous hazardous materials incidents do not accurately reflect the vulnerabilities that the City faces.

Vulnerability and Risk:

With the volume of traffic that flows along the described transportation routes described above, there is a possibility that a hazardous materials release will occur as the result of an accident. An accident of this type would close the freeway or street for several hours requiring traffic to detour through Monterey Park streets. In the event of an accident involving a vehicle carrying hazardous materials such as a toxic gas, the populated business and residential areas adjacent to the highway would have to be evacuated.

Hazardous Materials Incident Response

The Monterey Park Fire Department (MPFD) is responsible for responding to hazardous materials incidents in the City. Due to manning and budgetary constraints, the MPFD is limited in its response capabilities to the level defined by the California State Fire Marshall First Responder – Operational training standard. This standard limits the MPFD response to the following actions:

Safety – Identifying and assigning a safety officer
Isolation – Isolating and evacuating the affected area
Notification – Notify appropriate regulatory agencies and start a mitigation response
Command – Initiate an incident management system
Identify – Attempt to identify the released materials
Action Planning – Develop an action plan in conjunction with responding mitigation agencies

Currently, the City of Monterey Park enjoys the benefits of a Unified Response mutual aid system administered by the Verdugo Fire Communications System. In the event of a hazardous materials incident, Verdugo would provide a qualified hazardous materials response unit. In case a Verdugo unit is not available, the County of Los Angeles would be willing to provide hazardous materials units to the City.

The Monterey Park Police Department (MPPD) is responsible for maintaining the free flow of traffic through the City's transportation corridors and providing for the safety of the general public. In the event of a hazardous materials spill/release, it would be the MPPD's responsibility to cordon off the area limiting access to only the appropriate emergency response personnel. In addition, MPPD personnel would be responsible for any necessary evacuations.

TERRORISM & WEAPONS OF MASS DESTRUCTION (WMD)

Terrorism is defined as the use of fear for intimidation, usually for political goals. Terrorism is a crime where the threat of violence is often as effective as the commission of the violent act itself. Terrorism is a strategy used by individuals or groups to achieve their political goals through fear, physical injuries, economic losses, psychological trauma, and erosion of faith in government. Terrorists often use WMDs to achieve their goals of causing mass casualties and panicking the public. WMD incidents are unlike other incidents as the situation may not be easily recognizable, there may be multiple events, first responders are placed at a higher risk of becoming casualties, contamination of critical facilities and large geographic areas may result, the scope of the incident may expand geometrically, there will be a stronger reaction from the public than with other types of incidents, support facilities may be affected, and specialized State and local response capabilities may quickly be overwhelmed.

Terrorist Target Characteristics

Throughout California there is a limitless number of targets including government offices, shopping areas, religious facilities, water storage facilities, financial institutions, schools, and utility infrastructures. Monterey Park is no different than other cities in the Los Angeles metropolitan area in that it contains a number of potential terrorist targets.

Historic Incidents of Terrorism/Threat Analysis

While there is no historic record of terrorist incidents occurring within the City of Monterey Park, the catastrophic attacks on the World Trade Center, Pentagon, and Murrah Federal Building demonstrate that there are no domestic safe havens from terrorism. There is appropriate concern that the attacks witnessed in Tokyo, New York City, Oklahoma City, London, and Madrid could occur in California.

Vulnerability and Risk

It is not possible to estimate the probability of a terrorist attack. The approach experts use to prioritize mitigation and preparedness efforts is to identify critical sites and assess the vulnerability of these sites to terrorist attack. Critical sites include those that are essential to the functioning of the city, contain critical assets, or would cause significant impacts if attacked. The City of Monterey Park borders the City of Los Angeles, which is often identified as a probable target for terrorism. Depending upon the type of attack, the City of Monterey Park will most likely be affected as it is the closest suburban city to the east of downtown Los Angeles. Monterey Park also is home to several key governmental, financial, water storage, and utility facilities. However, specific information related to the exact locations, probability, and magnitude of this type of manmade hazard is considered sensitive homeland security related information. Risk and specific loss estimates cannot be calculated because of the unpredictable and sensitive nature of terrorism.

Terrorist Incident Response

In the event of a terrorist action within the City of Monterey Park, the Monterey Park Police Department will be the lead agency for crisis management, perimeter security, access control, traffic/crowd control, evacuations, notifications, and safeguarding evidence. In accordance with NIMS, the police department will request law enforcement mutual aid if needed to accomplish these functions. The department will work with Federal, State, and other local law enforcement agencies in coordinating activities.

The Monterey Park Fire Department will be the lead for fire response, hazardous materials events, and medical/rescue operations.

AVIATION DISASTER

Aviation disasters that occur in heavily populated residential area can result in considerable loss of life and property. The impact of a disabled aircraft that strikes the ground creates the likely potential for multiple explosions resulting in intense fires. The resulting explosions and fires have the potential to cause injuries, fatalities, and the destruction of property at and adjacent to the impact point.

Aviation Disaster Characteristics

Aviation disasters may occur due to mechanical failure, pilot error, or a deliberate act. The number of dead and injured persons along with the amount of property damage that occur from this type of disaster will be dependant upon the size of the aircraft involved, number of persons on the aircraft, location of the crash (residential, commercial, open field, etc.), and number of persons on the ground in the area of the impact. Damage assessment and disaster relief efforts associated with an air crash incident will require support from local governments, private organizations, and from state and local governmental and regulatory agencies.

Historic Incidents of Aviation Disaster

On March 3, 1991, a small airplane (Piper 28) crashed into two houses and an apartment building in a southwest Monterey Park neighborhood. The crash killed the pilot. No one on the ground was killed or injured. The houses and apartment building sustained structural damage.

While the March 3, 1991 crash is the only documented airplane crash in Monterey Park, incidents like the Aug. 31, 1986 collision of an Aeromexico DC-9 with a Piper Archer PA-28 over nearby Cerritos is an example of the damage that can occur when a aviation disaster occurs in a residential area. In the Cerrito disaster, the airplanes crashsed into a residential neighborhood, claiming 82 lives in all: 64 people on the jetliner, three people in the Piper, and 15 people on the ground. Damage to homes and other buildings was nearly $4 million. Seventeen homes were badly damaged or destroyed.

Vulnerability and Risk

The skies above Monterey Park are filled with commercial and private airplanes. Monterey Park is on the landing path of commercial airplanes inbound to the Los Angeles International Airport (LAX). Pilots use the Metropolitan Water District reservoir, located in the eastern portion of Monterey Park, as a landmark to turn over to begin their approach to LAX. In addition, there are a number of small private airplanes that fly in and out of nearby El Monte Airport that share the Monterey Park airspace with the commercial airliners. The 1991 airplane crash in Monterey Park along with other documented aviation disasters, such as the 1986 Cerritos disaster, illustrate the potential for disaster in this area due to the crash of an airplane.

Aviation Disaster Response

In the event of an aviation disaster within the City of Monterey Park, the Monterey Park Police Department will share first responder search and rescue responsibility with the Monterey Park Fired Department. MPPD will also be responsible for perimeter security, access control, traffic/crowd control, evacuations, notifications, and safeguarding evidence. In accordance with NIMS, the police department will request law enforcement mutual aid if needed to accomplish these functions. The department will work with Federal (FAA, NTSB), State, and other local law enforcement agencies in coordinating activities and the investigation of the incident.

The Monterey Park Fire Department will …...

COMMUNITY MANMADE HAZARD ISSUES

The impact upon the community will depend on the type and breadth of manmade hazard. While specialized resources will respond to the city to assist it make take time for that assistance to arrive. Local public safety resources may be depleted causing delayed responses to emergency and routine community service requests.

Community panic, intense media interest, and a surge of patients at local hospitals and urgent care centers can be expected. Rapid assessment of the size and type of incident, activation of the NIMS emergency management infrastructure, designation of injured field treatment and casualty collection points will be critical. Efforts to assess the situation and provide clear emergency management instructions to the public will be crucial. The following describe some concerns that may be expected from a manmade hazard incident:

<u>Downwind Evacuation</u>

The release of a caustic substance may cause a plume that travels for miles. Evacuation of local residents as well as notification to neighboring jurisdictions' emergency agencies will be necessary.

<u>Traffic Restrictions and Congestion</u>

Roads, freeways, and transit systems may be affected due to a manmade hazard incident. Panic may cause some residents to self evacuate. As a result of this, traffic congestion and gridlock may occur. These factors will slow the response time for assisting agencies, specialized resources and equipment, and additional emergency services personnel.

<u>Hospital Surge</u>

Injured victims or persons that believe they've been injured or exposed to a toxic substance may leave the area of a manmade hazard incident and transport themselves to care facilities. The influx of persons seeking treatment will impact the availability of treatment facilities for persons being sent to those facilities by on-site emergency services personnel.

MANMADE HAZARD MITIGATION ACTION ITEMS

The Monterey Park Police Department is part of the Los Angeles Area Terrorist Early Warning Group (TEW) and Los Angeles County Law Enforcement Mutual Aid Area "C". The Monterey Park Fire Department is part of the Verdugo Fire System and Los Angeles County Fire Mutual Aid Area "D". The mutual aid groups and Verdugo Fire System provide additional personnel and resources to the City of Monterey Park's emergency services in times of emergency.

The TEW provides integrated threat and net assessment from a multi-jurisdictional perspective. Local law enforcement and city and county fire departments work with emergency management, FBI, Department of Health Services, as well as other state and local agencies. The TEW group supports field response in the preparation for and response to acts of terrorism. The TEW provides Unified Command Structure, gauges resource needs and shortfalls, continuously monitors situational awareness and status, and acts as the point of contact for inter-agency liaison in order to develop options for incident resolution courses of action. TEW also provides support for Terrorism and Infrastructure protection, Public Order (Riots/Disturbances), Civil-Military Interoperability for Urban Operations, Networked Threats and Emerging Threats, and Counterterrorism Technology Test Bed.

The Manmade Hazards mitigation action items provide direction on specific activities that organizations and residents in the City of Monterey Park can undertake to reduce risk and prevent loss from windstorm events. Each action item is followed by ideas for implementation, which can be used by the Hazard Mitigation Planning Committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

<u>MITIGATION STRATEGY ITEMS:</u>

<u>Short Term Mitigation Action Items</u>

<u>Item # 1</u>

Program/Project:	Enhance the response capabilities of firefighters through training on event specific (manmade hazards) incidents.
Timeline:	2 years
Department:	Fire Department
Goal Addressed:	Provide a broad knowledge base to first responders.
Constraints:	Scheduling and availability of courses through the Office of Domestic Preparedness and the National Fire Academy as well as others. There may be budgetary constraints for seminars and conferences by other vendors.

<u>Item # 2</u>

Program/Project:	Develop response protocol and matrices for manmade hazard events other than hazardous materials response.
Timeline:	2+ years
Department:	Fire Department with input from affected city departments dependent on event type
Goal Addressed:	Appropriate and safe response to manmade hazard events

Constraints:	Dependent on the results of item #1 and the cooperation of other city departments

Item # 3

Program/Project:	Building access accountability/hardening of City Facilities
Timeline:	6 months – 2 years
Department:	City Manager's Office, Finance Department, Personnel Department, and Police Department
Goal Addressed:	Maintain and enhance the ability to provide emergency response services.

Long Term Mitigation Action Items

Item #1

Program/Project:	Sustained response capability cache.
Timeline:	1-5 years
Department	Fire Department
Goal Addressed:	Maintaining response capabilities throughout an extended disaster response. The fire department will purchase supplies, food stores and equipment that would accommodate the retention of personnel for the duration of a response for up to 200 city employees for a period of ten days.
Constraints:	Budgetary conditions mandate that this effort be undertaken over multiple fiscal years.

Item #2

Program/Project:	Enhance interoperability/communications
Timeline:	1-5 Years
Department:	Police Department
Goal Addressed:	Maintain and enhance the ability to provide emergency response services.

Item #3

Program/Project:	Local and Regional Training with Emergency Response Services
Timeline:	Ongoing
Department:	Police Department and Fire Department
Goal Addressed:	Maintain the ability to provide emergency response services.

SECTION 2:
- Community Profile -

Why Plan for Natural Hazards in City of Monterey Park?

Natural hazards impact citizens, property, the environment, and the economy of the City of Monterey Park. Earthquakes, historical flooding, landslides, wildfires and wind storms have exposed City of Monterey Park residents and businesses to the financial and emotional costs of recovering after natural disasters. The risk associated with natural hazards increases as more people move to areas affected by natural hazards.

Even in those communities that are essentially “built-out” i.e., have little or no vacant land remaining for development, population density continues to increase when low density housing is replaced with medium and high density development projects.

The inevitability of natural hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future natural hazard events. Identifying the risks posed by natural hazards, and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses can work together with the City to create a natural hazards mitigation plan that addresses the potential impacts of hazard events.

Geography and the Environment

The City of Monterey Park has an area of 7.6 square miles and is located just east of downtown Los Angeles, in Los Angeles County.

The City is 381 feet above sea level, on average. The terrain of the city is a combination of flat and hilly terrain.

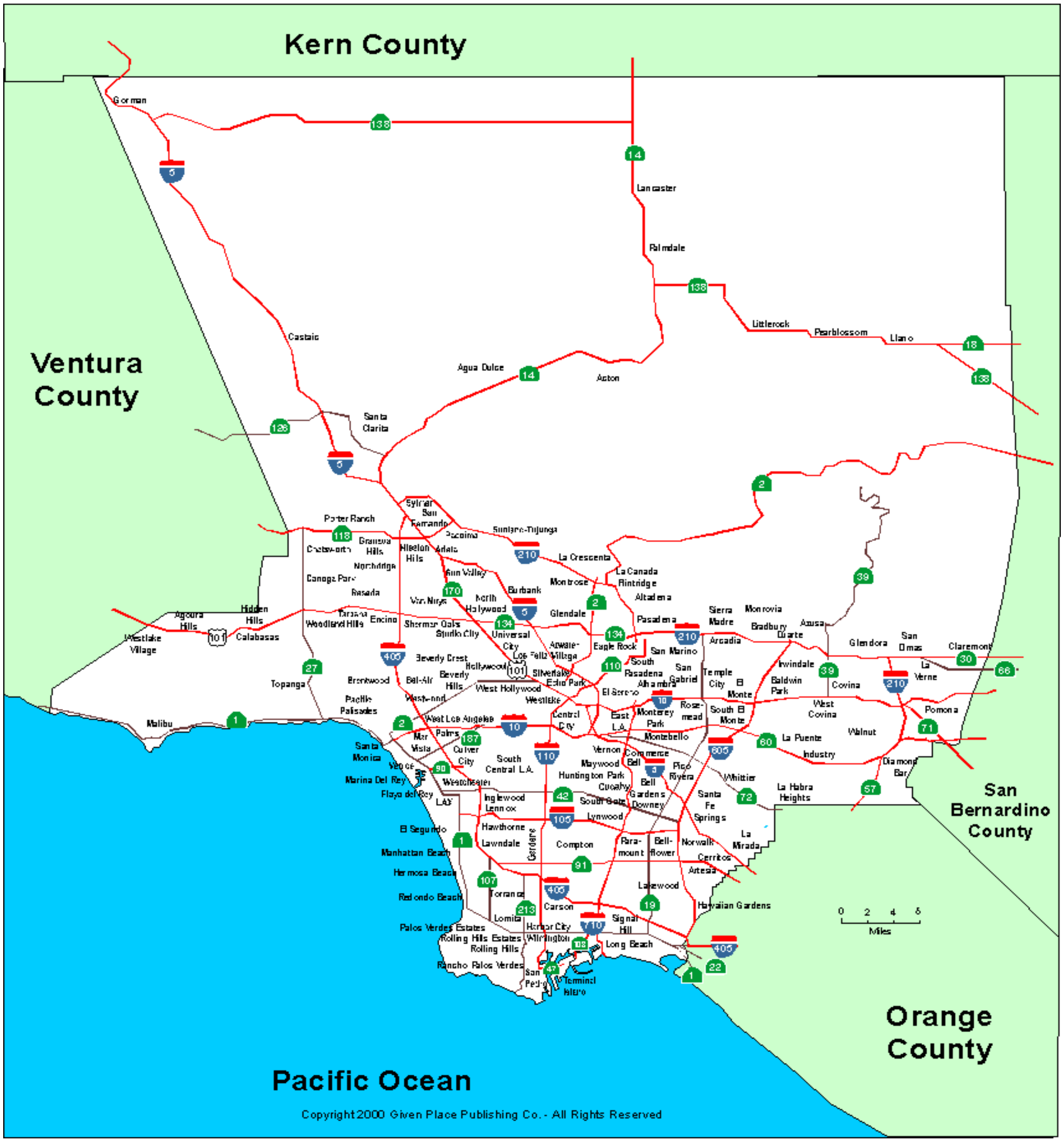
Community Profile

The City of Monterey Park is as rich in history. The area comprising the City of Monterey Park was first settled in the 1700’s and the city itself was incorporated in 1916. A subdivision of the Repetto Rancho was developed in 1906 and named Ramona Acres. The town was renamed upon incorporation after Monterey Pass to the west. (Now called Coyote Pass).

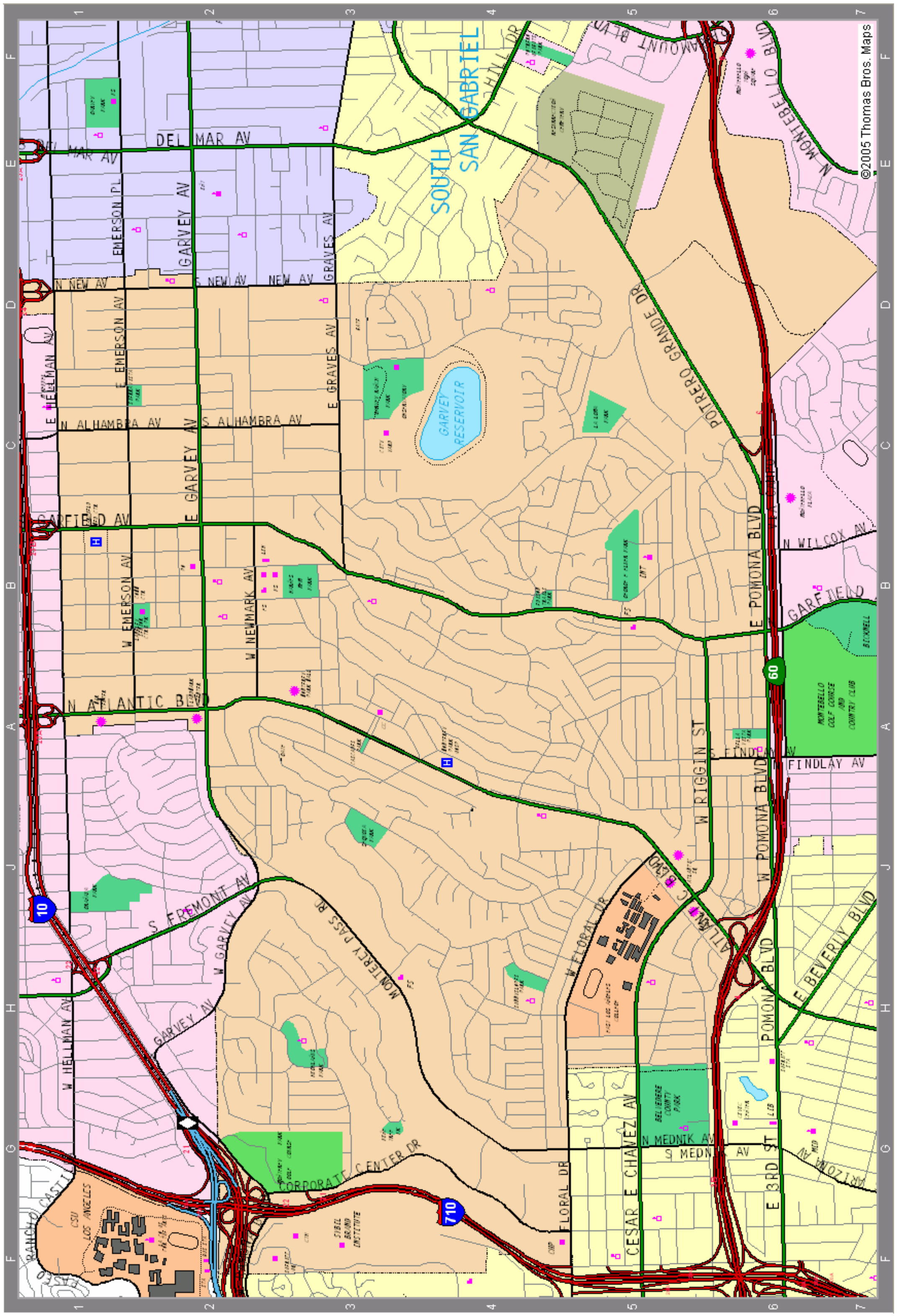
The City is served by the 710, 10 and 60 freeways, and the major arterial highways are, Atlantic Blvd, Garfield Ave and New Ave, which run north to south and, Valley Blvd, and Garvey Avenue, which run east to west.

Passenger transportation is provided by MTA and Monterey Park Spirit bus lines.

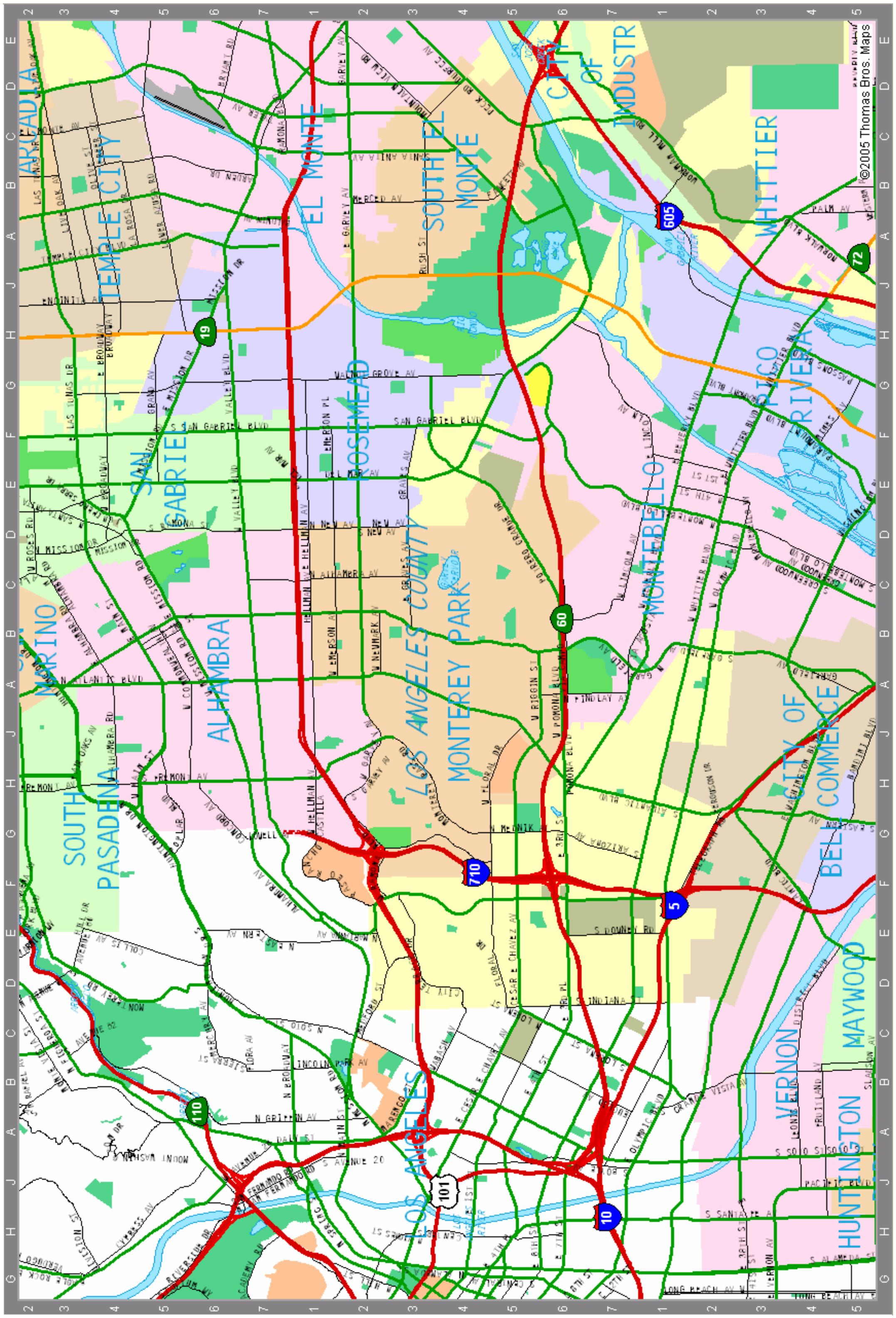
Freeway Map of Los Angeles County



Map of Monterey Park



Map of Monterey Park and Surrounding Communities



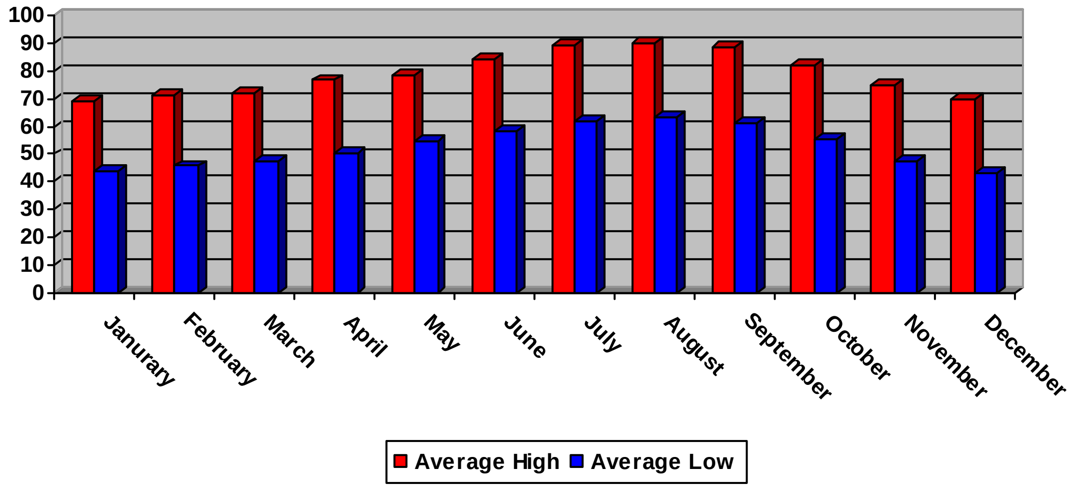
Major Rivers

The nearest major rivers are the San Gabriel, Rio Hondo, and Los Angeles Rivers. This River does not have any potential impact on the City of Monterey Park. Normally this river channel is dry and only carries a significant water flow during a major rain storm.

Climate

Temperatures in the City of Monterey Park range from a low of 56 degrees in the winter months to a high of 91 degrees in the summer months. However the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity. Temperatures rarely exceed 100 degrees F in the summer months (June - September), and rarely drop below 30 degrees F in the winter months (November-March).

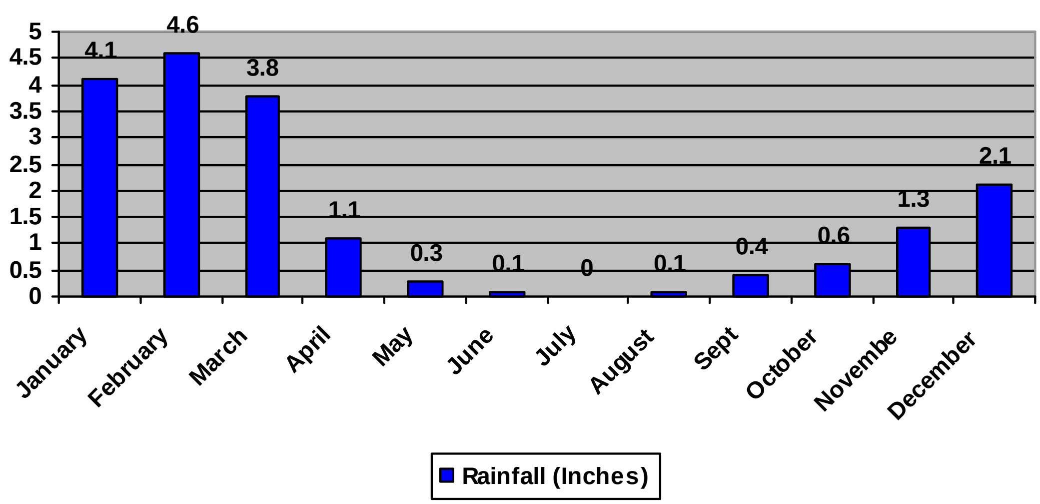
Average Temperature in Degrees Fahrenheit



Rainfall in the City averages 20.4 inches of rain per year. However the term "average rainfall" is misleading because over the recorded history of rainfall in the City of Monterey Park rain fall amounts have ranged from one-third the normal amount to more than double the normal amount. There are three types of storms that produce precipitation in the southern California area, which includes Monterey Park: winter storms, locally generated thunderstorms, and summer tropical storms.

Furthermore, actual rainfall in southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short, rainfall in southern California might be characterized as feast or famine within a single year. Because the metropolitan basin is largely built out, water originating in higher elevation communities can have a sudden impact on adjoining communities that have a lower elevation.

Average Yearly Rainfall in Inches



Minerals and Soils

The characteristics of the minerals and soils present in City of Monterey Park indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes, liquefaction and landslides.

The surface material includes unconsolidated, fine-grained deposits of silt, sand, gravel, and recent flood plain deposits. Torrential flood events can introduce large deposits of sand and gravel. Sandy silt and silt containing clay are moderately dense and firm, and are primarily considered to be prone to liquefaction, and earthquake related hazards. Basaltic lava consists mainly of weathered and non-weathered, dense, fine-grained basalt.

Understanding the geologic characteristics of City of Monterey Park is an important step in hazard mitigation and avoiding at-risk development.

Other Significant Geologic Features

The City of Monterey Park, like most of the Los Angeles Basin, lie over the area of one or more known earthquake faults, and potentially many more unknown faults, particularly so-called lateral or blind thrust faults.

The major faults that have the potential to affect the greater Los Angeles Basin, and therefore the City of Monterey Park are the:

- ✓ San Andreas
- ✓ Newport / Inglewood
- ✓ Palos Verdes
- ✓ Whittier
- ✓ Santa Monica
- ✓ Sierra Madre
- ✓ Verdugo
- ✓ Elysian Park
- ✓ Raymond

The Los Angeles Basin has a history of powerful and relatively frequent earthquakes, dating back to the powerful 8.0+ San Andreas earthquake of 1857 which did substantial damage to the relatively few buildings that existed at the time. Paleoseismological research indicates that large (8.0+) earthquakes occur on the San Andreas fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857.

Notable earthquakes include the Long Beach earthquake of 1933, the San Fernando earthquake of 1971, the 1987 Whittier earthquake and the 1994 Northridge earthquake.

In addition, many areas in the Los Angeles Basin have sandy soils that are subject to liquefaction. The City of Monterey Park has liquefaction zones as shown on the map in Appendix H.

Population and Demographics

The City of Monterey Park, has a 2000 Census population of 60,051 in an area of 7.6 square miles. The population of City of Monterey Park has steadily increased from the mid 1800's through 2000, and increased 4.5% from 1990 to 2000 according to the 2000 Census. This continued strong population growth is projected to continue according to the City of Monterey Park Planning Department.

Historic and Projected City of Monterey Park Population:

The increase of people living in City of Monterey Park creates more community exposure, and changes how agencies prepare for and respond to natural hazards. For example, more people living on the urban fringe can increase risk of fire.

In the 1987 publication, Fire Following Earthquake issued by the All Industry Research Advisory Council, Charles Scawthorn explains how a post-earthquake urban conflagration would develop. The conflagration would be started by fires resulting from earthquake damage, but made much worse by the loss of pressure in the fire mains, caused by either lack of electricity to power water pumps, and /or loss of water pressure resulting from broken water mains.

Furthermore, increased density can affect risk. The higher ratio of residents to emergency responders affects response times, and homes located closer together increase the chances of fires spreading.

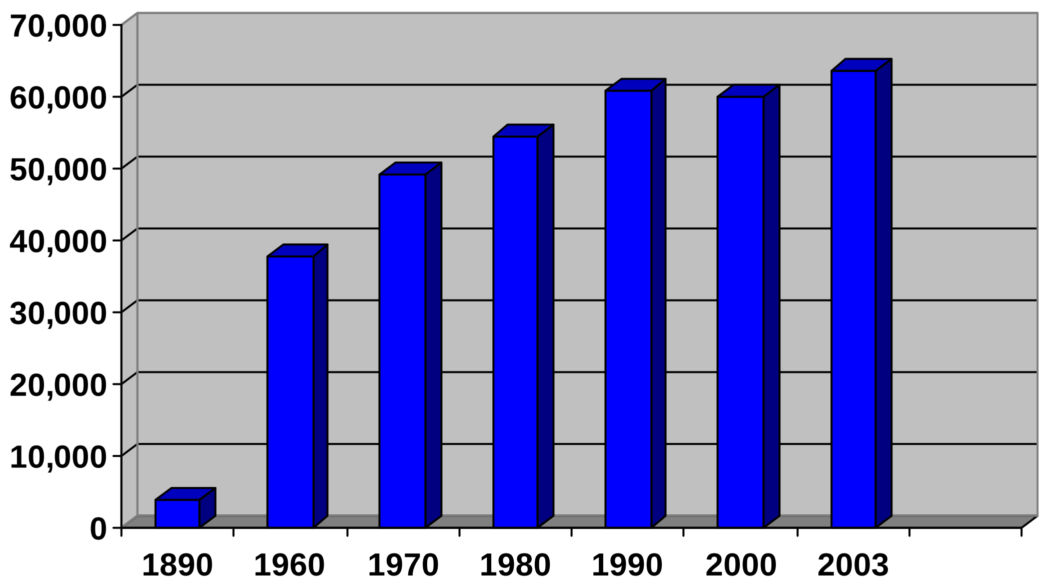
Over the years, the City of Monterey Park has experienced a great deal of in-fill development, which is increasing the population density creating greater service loads on the built infrastructure, including roads, water supply, sewer services and storm drains.

Natural hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed upon special needs groups: women, children, minorities, and the poor.

Year 2000 Census Figures - Demographic Make Up of the City:

RACE	PERCENT
White	21.29
Hispanic or Latino (of any race)	28.91
African-American	0.38
Asian	61.82
American Indian and Alaska Native	0.65
Native Hawaiian and Other Pacific Islander	0.06
Other race	12.45
Two or more races	3.35

Population 1890 – 2003 (In Thousands)



Percentage of Poverty in City of Monterey Park per the 2000 Census:

POVERTY STATUS	PERCENT
Families	
Percent below poverty level	12.4
With related children under 18 years	
Percent below poverty level	18.9
With related children under 5 years	
Percent below poverty level	17.6
Families with female householder, no husband present	
Percent below poverty level	22.1
With related children under 18 years	
Percent below poverty level	32.8
With related children under 5 years	
Percent below poverty level	33.9
Individuals	
Percent below poverty level	15.6
18 years and over	
Percent below poverty level	13.7
65 years and over	
Percent below poverty level	9.2
Related children under 18 years	
Percent below poverty level	22.6
Related children 5 to 17 years	
Percent below poverty level	24.0
Unrelated individuals 15 years and over	
Percent below poverty level	30.9

Vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living in poverty, may be disproportionately impacted by natural hazards.

Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of natural hazards recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about natural hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

The ethnic and cultural diversity suggests a need to address multi-cultural needs and services.

Land and Development

Development in Southern California from the earliest days was a cycle of boom and bust. The Second World War however dramatically changed that cycle. Military personnel and defense workers came to Southern California to fill the logistical needs created by the war effort. The available housing was rapidly exhausted and existing commercial centers proved inadequate for the influx of people. Immediately after the war, construction began on the freeway system, and the face of Southern California was forever changed. Home developments and shopping centers sprung up everywhere and within a few decades the central basin of Los Angeles County was virtually built out. This pushed new development further and further away from the urban center.

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

The environment of most Los Angeles County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is seamless to most people. Seamless too are the exposures to the natural hazards that affect all of Southern California.

Housing and Community Development

In the City of Monterey Park the demand for housing outstrips the available supply, and the recent low interest rates have further fueled a pent up demand. Demand for available housing is estimated to be extremely strong with very few existing homes available Demand for low to medium priced homes continues to be strong. The average value for homes in the City of Monterey Park was estimated at $383,600.00. (2000 Census). However, May 2004 figures indicate the median price for a home in Monterey Park has now jumped to $425,000.00 and this trend is expected to continue into the foreseeable future.

To address development issues, the Community Redevelopment Agency has engaged in activities that promote the quality of life for the citizens of the City of Monterey Park. The large-scale effort is an on-going program and includes neighborhood and other public facility improvements, rehabilitation of existing housing, and new housing development.

HUD provides funding for City of Monterey Park's Community Program.

The City participates in the Community Development Block Grant (CDBG) program. The primary resource available to address non-housing community development needs is the CDBG.

The City of Monterey Park's Economic Development Commission (EDC) is a body that helps to promote economic prosperity throughout the City. The EDC's mission is to promote development while maintaining quality of life and integrity of the environment.

There is an increased concentration of resources and capital in City of Monterey Park. The best indicator of this fact is the increasing per capita personal income in the region since the 1970's. Per capita income is an estimate of total personal income divided by the total population. The median household income in 2000 was $55,728.00.

This estimate can be used to compare economic areas as a whole, but it does not reflect how the income is distributed among residents of the area being examined. The City's per capita personal income is also increasing relative to California's and the United State's average per capita incomes, resulting in a more affluent community than the average population.

Subtle but very measurable changes occur constantly in communities that increase the potential loss that will occur in a major disaster. There are a number of factors that contribute to this increasing loss potential. First, populations continue to increase, putting more people at risk within a defined geographic space. Second, inflation constantly increases the worth of real property and permanent improvements. Third, the amount of property owned per capita increases over time.

Information from the U.S. Census Bureau shows gains in average housing standards.

Amount of Property per person	1975	1998
Increased Size of new homes	1645 sq. ft.	2190 sq. ft.
% of homes with 4 + bedrooms	21%	33%
% of homes with 2 ½ or more baths	20%	52%

Source: U.S. Department of Census

If we look at the greatest recorded earthquakes in American history, and compare the level of population and development today with that which existed at the time of the event, the scale of potential damage is staggering.

- ✓ 1886 Charleston EQ M7.3 in Charleston, SC
  Estimated insured damage if happened today $10 Billion

- ✓ 1906 San Francisco EQ M8.3 Significant fire following damage
  Estimated insured damage if happened today $36 Billion

- ✓ 1811-12 New Madrid EQ 1811-12, series of 4 EQs over 7 weeks
  Estimated insured damage if happened today $88 Billion

Source: Risk Management Solutions

Employment and Industry

Auto sales, banking, medical, education, and food service are the principal employment and industrial activities in Monterey Park. The City business climate has been strong and growing with professional firms now located in the City. City of Monterey Park provided over 19,456 jobs in 2000. Occupations of persons 16 years and older who were employed in 2000 are apportioned as follows:

EMPLOYMENT BY INDUSTRY	PERCENT
Agriculture, forestry, fishing and hunting, and mining	0.1
Construction	2.9
Manufacturing	15.7
Wholesale trade	7.1
Retail trade	10.8
Transportation and warehousing, and utilities	4.8
Information	3.2
Finance, insurance, real estate, and rental and leasing	8.9
Professional, scientific, management, administrative and waste mgt.	9.7
Educational, health and social services	17.5
Arts, entertainment, recreation, accommodation and food services	10.4
Other services (except public administration)	4.8
Public administration	3.9

Mitigation activities are needed at the business level to ensure the safety and welfare of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from surrounding areas to industrial and business centers. This creates a greater dependency on roads, communications, accessibility and emergency plans to reunite people with their families. Before a natural hazard event, large and small businesses can develop strategies to prepare for natural hazards, respond efficiently, and prevent loss of life and property.

Transportation and Commuting Patterns

The City of Monterey Park is the 19th largest in the Los Angeles Metropolitan Statistical Area (LAMSA). Over the past decade, the LAMSA experienced rapid growth in employment and population. There has been a constant increase in vehicle licensing transactions in the Los Angeles region.

Type of Vehicle	2001	2000	1999	1998
Autos	5,296,141	5,134,168	4,935,605	4,825,512
Trucks	1,026,961	1,021,397	991,315	970,993
Trailers	288,638	283,402	288,487	262,506
Motorcycles	87,986	81,167	75,569	74,210
Total	6,699,726	6,520,134	6,290,976	6,133,221

Private automobiles are the dominant means of transportation in Southern California and in the City of Monterey Park.

However, the City of Monterey Park meets its public transportation needs through a mixture of a regional transit system (MTA), and various city contracted bus systems. MTA provides both bus and light rail service to the City of Monterey Park and to the Los Angeles County metropolitan area. In addition to this service, the City promotes alternative transportation activities.

Earthquakes and localized flooding can render roads unusable. A severe winter storm has the potential to disrupt the daily driving routine of hundreds of thousands of people. Natural hazards can disrupt automobile traffic and shut down local and regional transit systems.

SECTION 3:
- Risk Assessment -

What is a Risk Assessment?

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

1) Hazard Identification

This is the description of the geographic extent, potential intensity and the probability of occurrence of a given hazard. Maps are frequently used to display hazard identification data. The City of Monterey Park identified seven major hazards that affect this geographic area. These hazards - earthquakes, flooding, landslides, wildfires, windstorms, severe weather and water vulnerability - were identified through extensive research of historical records, agency publications, news reports, the Internet, and input from the Hazard Mitigation Advisory Committee. The geographic extent of each hazard has been identified by the City of Monterey Park using the best available data, and is illustrated by the charts/maps provided in Appendix H.

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard, how it has affected City of Monterey Park in the past, and what part of the City of Monterey Park's population, infrastructure, and environment has historically been vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in each hazard section. For a full description of the history of hazard specific events, please see the appropriate hazard chapter.

3) Vulnerability Assessment/Inventorying Assets

This is a combination of hazard identification with an inventory of the existing (or planned) property development(s) and population(s) exposed to a hazard. Critical facilities are of particular concern because these entities provide essential products and services to the general public that are necessary to preserve the welfare and quality of life in the City and fulfill important public safety, emergency response, and/or disaster recovery functions. The critical facilities have been identified, charted, and are illustrated in Chart 3 at the end of this section. A description of the critical facilities in the City is also provided in this section. In addition, this plan includes a community issues summary in each hazard section to identify the most vulnerable and problematic areas in the City, including critical facilities, and other public and private property.

4) Risk Analysis

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

5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of land uses and development trends within the community so that mitigation options can be considered in land use planning and future land use decisions. This plan provides comprehensive description of the character of City of Monterey Park in the Community Profile. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of City of Monterey Park can help in identifying potential problem areas, and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Note: The information on the maps in this plan was derived from City of Monterey Park and other sources. Care was taken in the creation of these maps, but is provided "as is" City of Monterey Park cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

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

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in each hazard section of this Plan. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure. Action items throughout the hazard sections provide recommendations to collect further data to map hazard locations and conduct hazard assessments.

Federal Requirements for Risk Assessment:

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201 include a requirement for risk assessment. This risk assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazards. There are three hazards profiled in the mitigation plan, including earthquakes, flooding, and wind storms. The Federal criteria for risk assessment and information on how the City of Monterey Park's Natural Hazard Mitigation Plan meets those criteria is outlined in Table 3-2 below.

Federal Criteria for Risk Assessment:

Section 322 Plan Requirement	How is this addressed?
Identifying Hazards	**Each hazard section includes an inventory of the best available data sources that identify hazard areas. To the extent data are available, the City developed maps identifying the location of the hazard in the City. The Executive Summary and the Risk Assessment sections of the plan include a list of the hazard maps.**
Profiling Hazard Events	**Each hazard section includes documentation of the history, and causes and characteristics of the hazard in the City.**
Assessing Vulnerability: Identifying Assets	**Where data is available, the vulnerability assessment for each hazard addressed in the mitigation plan includes an inventory of all publicly owned land within hazardous areas. Each hazard section provides information on vulnerable areas in the City in the Community Issues section. Each hazard section also identifies potential mitigation strategies.**
Assessing Vulnerability: Estimating Potential Losses:	**The Risk Assessment Section of this mitigation plan identifies key critical facilities and lifelines in the City and includes a map of these facilities. Vulnerability assessments have been completed for the hazards addressed in the plan, and quantitative estimates were made for each hazard where data was available.**
Assessing Vulnerability: Analyzing Development Trends	**The City of Monterey Park Profile Section of this plan provides a description of the development trends in the City, including the geography and environment, population and demographics, land use and development, housing and community**

	development, employment and industry, and transportation and commuting patterns.

Critical Facilities and Infrastructure:

Facilities critical to government response and recovery activities (i.e., life safety and property and environmental protection) include: 911 centers, emergency operations centers, police and fire stations, public works facilities, communications centers, sewer and water facilities, hospitals, bridges and roads, shelters, and facilities, that, if damaged, could cause serious secondary impacts may also be considered "critical." A hazardous material facility is one example of this type of critical facility.

Critical and essential facilities are those facilities that are vital to the continued delivery of key government services or that may significantly impact the public's ability to recover from the emergency. These facilities may include: buildings such as the jail, law enforcement center, public services building, community corrections center, the courthouse, and juvenile services building and other public facilities such as schools. The charts/maps in Appendix H, illustrate the critical facilities, essential facilities, public infrastructure, and emergency transportation routes within the City of Monterey Park

Summary:

Natural hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Natural hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes, and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of natural hazards.

SECTION 4:
- Multi-Hazard Goals and Action Items -

This section provides information on the process used to develop goals and action items that pertain to the six natural hazards addressed in the mitigation plan as well as manmade hazards. It also describes the framework that focuses the plan on developing successful mitigation strategies. The framework is made up of three parts: the Mission, Goals, and Action Items.

Mission:

The mission of the City of Monterey Park Local Hazards Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural and manmade hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City towards building a safer, more sustainable community.

Goals:

The plan goals describe the overall direction that City of Monterey Park agencies, organizations, and citizens can take to minimize the impacts of natural and manmade hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations that are outlined in the action items.

Action Items:

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that City agencies may implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years (or more) to implement.

Mitigation Plan Goals and Public Participation:

The Plan goals help to guide direction of future activities aimed at reducing risk and preventing loss from natural or manmade hazards. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

Protect Life and Property:

- ✓ Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural and manmade hazards.

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

- ✓ Improve hazard assessment information to make recommendations for discouraging new development and encouraging preventative measures for existing development in areas vulnerable to natural hazards.

Public Awareness:

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

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

Natural Systems:

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

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

Partnerships and Implementation:

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

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

Emergency Services:

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

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

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

Public Participation:

Public input during development of the mitigation plan assisted in creating plan goals. Meetings with the project coordinating committee, stakeholder interviews, and a public meeting served as methods to obtain input and identify priorities in developing goals for reducing risk and preventing loss from natural hazards in the City of Monterey Park.

On May 1, 2008, the first public meeting was held to gather ideas from the City of Monterey Park residents regarding the goals for the City of Monterey Park Local Hazards Mitigation Plan. The attendees invited included representatives from public agencies, private organizations, Community Planning Organizations, and private residents. The attendees identified goals for the plan by examining the issues and concerns that they have had regarding natural hazards, and further discussed potential action items for the Plan.

The second public meeting was held May 19, 2008 to review mitigation plan action items and provide the participants with a chance to comment on the final plan recommendations

Local Hazard Mitigation Plan Action Items

The mitigation plan identifies short and long-term action items developed through data collection and research, and the public participation process. Mitigation plan activities may be considered for funding through Federal and State grant programs, and when other funds are made available through the city. Action items address multi-hazard (MH) and hazard specific issues. To help ensure activity implementation, each action item includes information on the time line and coordinating organizations. Upon implementation, the coordinating organizations may look to partner organizations for resources and technical assistance.

A description of the partner organizations is provided in Appendix A, the resource directory of this plan.

Coordinating Organization:

The coordinating organization is the organization that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, city, or regional agencies that are capable of or responsible for implementing activities and programs.

Time line:

Action items include both short and long-term activities. Each action item includes an estimate of the time line for implementation. Short-term action items are activities that city agencies may' implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities, and may take between one and five years (or more) to implement.

Ideas for Implementation:

Each action item includes ideas for implementation and potential resources, which may include grant programs or human resources.

Plan Goals Addressed:

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

Constraints:

Constraints may apply to some of the action items. These constraints may be a lack of city staff, lack of funds, or vested property rights that might expose the City to legal action as a result of adverse impacts on private property.

Project Evaluation Worksheets:

Each jurisdiction will have some limitations on the number and cost of mitigation activities that can be completed within a given period of time. There are likely to be multiple ideas to mitigate the effects of a given hazard. Therefore it will be necessary for the committee to select the most cost effective mitigation projects and to further prioritize them. To assist the committee in the Benefit Cost Analysis (BCA) a Project Evaluation Worksheet is included at the end of Section 4. The data on these worksheets will help the committee determine the most cost effective mitigation solutions for the community. Some projects may need more detailed BCA, but this worksheet will provide a first screening methodology.

Multi-Hazard Action Items:

Multi-hazard action items are those activities that pertain to two or more of the seven hazards in the mitigation plan: flood, landslide, wildfire, windstorm, earthquake, drought and man-made hazards. There are six short-term and three long-term multi-hazard action items described below.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

SHORT TERM ACTIVITY- MULTI HAZARD #l:

Integrate the goals and action items from the City of Monterey Park Local Hazards Mitigation Plan into existing regulatory documents and programs, where appropriate.

Ideas for Implementation:

- Use the mitigation plan to help the city's General Plan institutionalize guidelines for sustainable development in all new construction and development projects according to the hazards that impact the City of Monterey Park
- Integrate the city's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas: and
- Partner with other organizations and agencies with similar goals to promote Building & Safety Codes that are more disaster resistant at the state level.
- Plan integration is the responsibility of the City Manager. The City Manager will designate that the appropriate city departments will address individual mitigation goals.

Coordinating Organization:	Hazard Mitigation Advisory Committee under the guidance of the City Manager
Time line:	One to two years with ongoing revisions and updates
Plan Goals Addressed:	Partnerships and Implementation
Constraints:	Pending funding and available personnel

SHORT TERM ACTIVITY - MULTI HAZARD #2:

Identify and pursue funding opportunities to develop and implement local and city mitigation activities.

Ideas for Implementation:

- Develop incentives for local governments, citizens, and businesses to pursue hazard mitigation projects:

Coordinating Organization:	Planning Department

Time line:	One to two years with ongoing revisions and updates
Plan Goals Addressed:	Partnerships and Implementation
Constraints:	Pending funding and available personnel

SHORT TERM ACTIVITY - MULTI HAZARD #3:

Establish a formal role for the City of Monterey Park Local Hazards Mitigation Committee to develop a sustainable process for implementing, monitoring, and evaluating citywide mitigation activities.

Ideas for Implementation:

- Establish clear roles for participants, meeting regularly to pursue and evaluate implementation of mitigation strategies.
- Oversee implementation of the mitigation plan and maintain timeline compliance.
- Establish measurable standards to evaluate mitigation policies and programs and provide a mechanism to update and revise the mitigation plan.
- Monitor hazard mitigation implementation by jurisdictions and participating organizations through surveys and other reporting methods.
- Develop updates for the Local Hazards Mitigation Action Plan based on new information.
- Conduct a full review of the Local Hazards Mitigation Action Plan every 5 years by evaluating mitigation successes, failures, and areas that were not addressed.
- Provide training for Committee members to remain current on developing issues in the natural hazard loss reduction field.

Coordinating Organization:	Hazard Mitigation Advisory Committee under the guidance of the City Manager
Time line:	Meetings and review of plan progress to be held at least annually with additional meetings as necessary.
Plan Goals Addressed:	Partnerships and Implementation
Constraints:	Pending funding and available personnel

SHORT TERM ACTIVITY - MULTI HAZARD #4:

Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases risk to natural hazards.

Ideas for Implementation:

- Distribute information about flood, fire, earthquake, and other forms of natural hazards insurance to property owners in areas identified to be at risk through hazard mapping.
- Develop a one-page handout on types of insurance and deliver through city utility or service agencies.
- Educate individuals and businesses on the benefit of engaging in mitigation activities such as developing impact analyses.
- Pinpoint areas of high risk and transfer the cost of risk to property owners through insurance (rather than to the public).
- Encourage the development of unifying organizations to ensure communication and dissemination of natural hazard mitigation information.

Multi hazard Action Items:

- Identify activities for private sector and citizen involvement such as nonstructural seismic daycare retrofits.

Coordinating Organization:	City Planning Department
Time line:	One to two years for implementation, annual monitoring
Plan Goals Addressed:	Protect Life and Property, Public Awareness, Partnerships and Implementation
Constraints:	Pending funding and available personnel

SHORT TERM ACTIVITY - MULTI HAZARD #5:

Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in City of Monterey Park.

Ideas for Implementation:

- Work with city governments to develop Local Hazards Mitigation Plans that are consistent with the goals and framework of the city plan.
- Identify all organizations within City of Monterey Park that have programs or interests in local hazards mitigation.
- Involve private businesses throughout the city in mitigation planning.
- Improve communication between Cal Trans and public works department, and work together to prioritize and identify strategies to deal with road problems.
- Establish protocol for communication electric providers and the Department of Transportation and Development to assure rapid restoration of transportation capabilities.

Coordinating Organization:	City Planning Department
Time line:	One to two years for implementation, annual monitoring
Plan Goals Addressed:	Partnerships and Implementation
Constraints:	Pending funding and available personnel

SHORT TERM ACTIVITY - MULTI HAZARD #6:

Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.

Ideas for Implementation:

- Identify critical facilities at risk from local hazards events.
- Develop strategies to mitigate risk to these facilities, or to utilize alternative facilities should local hazards events cause damages to the facilities in question.
- Identify bridges at risk from flood or earthquake hazards, identify enhancements, and implement projects needed to reduce the risks.

Coordinating Organization:	City Planning Department
Time line:	1-2 Years
Plan Goals Addressed:	Protect Life and Property, Partnerships and Implementation
Constraints:	Pending funding and available personnel

LONG TERM ACTIVITY - MULTI HAZARD #1:

Strengthen emergency services preparedness and response by linking emergency services with local hazard mitigation programs, and enhancing public education on a regional scale.

Ideas for Implementation:

- Educate private property owners on limitations of bridges and dangers associated with them.
- Encourage individual and family preparedness through public education projects such as safety fairs.
- Coordinate the maintenance of emergency transportation routes though communication among the City Roads Department, neighboring jurisdictions, and the California Department of Transportation.
- Identify opportunities for partnering with citizens, private contractors, and other jurisdictions to increase availability of equipment and manpower for efficiency of response efforts.
- Familiarize public officials of requirements regarding public assistance for disaster response.
- Increase public awareness of emergency response needs and limitations. This can be accomplished through enhancement of the existing Community Emergency Response Team (CERT). Currently, trained CERT members number 35. The Monterey Park Fire Department has a stated goal of 100 active CERT members. This goal may necessitate the training of 200 or more citizens.

Coordinating Organization:	Fire Department
Time line:	Immediate emphasis with increasing efforts throughout the life of the plan
Plan Goals Addressed:	Emergency Services
Constraints:	Pending funding and available personnel

LONG TERM ACTIVITY - MULTI HAZARD-MH #2:

Develop, enhance, and implement education programs aimed at mitigating hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.

Ideas for Implementation:

- Make the City of Monterey Park Local Hazards Mitigation Plan available to the public by publishing the plan electronically on the city and emergency management websites.
- Enhance mapping capabilities by creating a website that includes information specific to City of Monterey Park residents, such as, Building & Safety Codes information, and educational information on damage prevention.
- Develop a web page to facilitate Internet discussions and information sharing.
- Develop and complete a baseline survey to gather perceptions of private citizens and the business community regarding natural hazard risks and identify mitigation needs. Repeat the survey in five years to monitor successes and failures of natural hazard mitigation programs.
- Develop outreach programs to business organizations that must prepare for flooding events.
- Develop adult and child educational programs to be used by local cable stations.
- Use local cable stations as a conduit for advertising public forums.
- Education: Develop curriculum for school programs and adult education on reducing risk and preventing loss from natural or manmade hazards.
- Conduct hazards awareness programs in schools and community centers.
- Conduct meetings for public and private sector organizations to raise awareness of mitigation activities and programs.
- Develop outreach materials for mitigation, preparedness, response and recovery.

Coordinating Organization:	City Public Safety Departments, City IT
Time line:	Within the life of the plan

Plan Goals Addressed:	Public Awareness, Protect Life and Property
Constraints:	Pending funding and available personnel

LONG TERM ACTIVITY - MULTI HAZARD #3:

Use technical knowledge of natural ecosystems and events to link natural resource management and land use organizations to mitigation activities and technical assistance.

Ideas for Implementation:

- Review ordinances that protect natural systems and resources to mitigate for natural hazards for possible enhancements.
- Pursue vegetation and restoration practices that assist in enhancing and restoring the natural and beneficial functions of the watershed.
- Develop education and outreach programs that focus on protecting natural systems as a mitigation activity.

Coordinating Organization:	City Planning Department
Time line:	Program development within two years, Ongoing
Plan Goals Addressed:	Natural Systems
Constraints:	Availability of personnel

SECTION 5:
- Plan Maintenance -

The plan maintenance section of this document details the formal process that will ensure that the City of Monterey Park Local Hazards Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the city will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how City of Monterey Park government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City General Plan, Capital Improvement Plans, and Building and Safety Codes.

Monitoring and Implementing the Plan

Plan Adoption:

The City Council will be responsible for adopting the City of Monterey Park Local Hazards Mitigation Plan. This governing body has the authority to promote sound public policy regarding natural and man-made hazards. Once the plan has been adopted, the City Emergency Manager will be responsible for submitting it to the State Hazard Mitigation Officer at The Governor's Office of Emergency Services. The Governor's Office of Emergency Services will then submit the plan to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, City of Monterey Park will gain eligibility for Hazard Mitigation Grant Program funds.

Coordinating Body:

A City of Monterey Park Hazard Mitigation Committee will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The City Manager will assign representatives from city agencies, including, but not limited to, the current Hazard Mitigation Advisory Committee members. The city has formed a Hazard Mitigation Committee that consists of members from local agencies, organizations, and citizens, and includes the following*:*

- ✓ City of Monterey Park Emergency Management
- ✓ City of Monterey Park Finance
- ✓ City of Monterey Park Fire Department
- ✓ City of Monterey Park Police Department
- ✓ City of Monterey Park Information Technology
- ✓ City of Monterey Park Planning Division
- ✓ City of Monterey Park Public Information Officer
- ✓ City of Monterey Park Public Works Division

- ✓ City of Monterey Park Building and Safety Department
- ✓ City of Monterey Park Water and Environment Services
- ✓ California Division of Mines and Geology
- ✓ Federal Emergency Management Agency
- ✓ The Governor's Office of Emergency Services

In order to make this committee as broad and useful as possible, the City Manager will engage other relevant organizations and agencies in hazard mitigation. The recommendations for adding to the Hazard Mitigation Advisory Committee include:

- ✓ An elected official
- ✓ A representative from the Chamber of Commerce
- ✓ An insurance company representative
- ✓ Community Planning Organization representatives
- ✓ A representative from the City Manager's office
- ✓ Representation from professional organizations such as the Home Builders Association
- ✓ A representative from Area "C"

The Hazard Mitigation Advisory Committee will meet no less than quarterly. Meeting dates will be scheduled once the final Hazard Mitigation Advisory Committee has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

Convener:

The City Council will adopt the City of Monterey Park Local Hazard Mitigation Plan, and the Hazard Mitigation Advisory Committee will take responsibility for plan implementation. The City Manager will serve as a convener to facilitate the Hazard Mitigation Advisory Committee meetings, and will assign tasks such as updating and presenting the Plan to the members of the committee. Plan implementation and evaluation will be a shared responsibility among all of the Local Hazard Advisory Committee Members.

The City Manager has designated the Fire Chief to be in charge of plan maintenance and updating. The Fire Department will schedule and assign updates to the appropriate city departments at suitable intervals to ensure that the Plan is accurate and up to date.

Implementation through Existing Programs:

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

The City of Monterey Park Development Services, which includes the Building and Safety element, is responsible for administering the Building & Safety Codes. In addition, the Hazard Advisory Committee will work with other agencies at the state level to review, develop and ensure Building & Safety Codes that are adequate to mitigate or present damage by natural and man-made hazards. This is to ensure that life-safety criteria are met for new construction.

The goals and action items in the mitigation plan may be achieved through activities recommended in the city's Capital Improvement Plans (CIP). Various city departments develop CIP plans, and review them on an annual basis. Upon annual review of the CIPs, the Hazard Mitigation Advisory Committee will work with the city departments to identify areas that the hazard mitigation plan action items are consistent with CIP planning goals and integrate them where appropriate.

Within the next fiscal year, after formal adoption of the mitigation plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms at the city level. The meetings of the Hazard Mitigation Advisory Committee will provide an opportunity for committee members to report back on the progress made on the integration of mitigation planning elements into city planning documents and procedures.

Economic Analysis of Mitigation Projects:

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

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

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

Given federal funding, the Hazard Mitigation Advisory Committee will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Hazard Mitigation Advisory Committee will use other approaches to understand the costs and benefits of each action item and develop a prioritized list. For more information regarding economic analysis of mitigation action items, please see Appendix C of the Plan.

Evaluating and Updating the Plan:

Formal Review Process:

The City of Monterey Park Local Hazards Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and time line, and identifies the local agencies and organizations participating in plan evaluation. The convener or designee will be responsible for contacting the Hazard Mitigation Advisory Committee members and organizing the annual meeting.

Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The committee will review the goals and action items to determine their relevance to changing situations in the city, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The convener will assign the duty of updating the plan to one or more of the committee members. The designated committee members will have three months to make appropriate changes to the Plan before submitting it to the Hazard Committee members, and presenting it to the City Council. The Hazard Mitigation Advisory Committee will also notify all holders of the city plan when changes have been made. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer and the Federal Emergency Management Agency for review.

Continued Public Involvement:

Monterey Park is dedicated to involving the public directly in review and updates of the Hazard Mitigation Plan. The Hazard Mitigation Committee members are responsible for the annual review and update of the plan.

The public will also have the opportunity to provide feedback about the Plan. Copies of the Plan will be catalogued and kept at all of the appropriate agencies in the city. The existence and location of these copies will be publicized in the quarterly city newsletter, which reaches every household in the city. The plan also includes the address and the phone number of the city Planning Division, responsible for keeping track of public comments on the Plan.

In addition, information on how to obtain copies of the plan and any proposed changes will be posted on the city website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

A public meeting will also be held after each annual evaluation or when deemed necessary by the Hazard Mitigation Advisory Committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan. The City Public Information Officer will be responsible for using city resources to publicize any future Hazard Mitigation public meetings and maintain public involvement through the public access channel, web page, and newspapers.

SECTION 6:
- EARTHQUAKE –

Table of Contents

Why Are Earthquakes a Threat to the City of Monterey Park?

The City of Monterey Park lies within a region with several active faults and therefore is subject to the risks and hazards associated with earthquakes. The most recent significant earthquake event affecting Southern California was the January 17th, 1994 Northridge Earthquake. At 4:31 A.M. on Monday, January 17, a moderate but very damaging earthquake with a magnitude of 6.7 struck the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures.

57 people were killed and more than 1,500 people seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas; and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless. 66,500 buildings were inspected. Nearly 4,000 were severely damaged and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but earthquake triggered liquefaction and dozens of fires also caused additional severe damage. This extremely strong ground motion in large portions of Los Angeles County resulted in record economic losses.

However, the earthquake occurred early in the morning on a holiday. This circumstance considerably reduced the potential effects. Many collapsed buildings were unoccupied, and most businesses were not yet open. The direct and indirect economic losses ran into the 10's of billions of dollars. Like many neighboring cities, the City of Monterey Park felt the jolt of the Northridge Earthquake; fortunately, the City did not experience any significant property damage or loss of life.

Historical and geological records show that California has a long history of seismic events. Southern California is probably best known for the San Andreas Fault, a 400 mile long fault running from the Mexican border to a point offshore, west of San Francisco. “Geologic studies show that over the past 1,400 to 1,500 years large earthquakes have occurred at about 130 year intervals on the southern San Andreas fault. As the last large earthquake on the southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades.

But San Andreas is only one of dozens of known earthquake faults that criss-cross Southern California. Some of the better known faults include the Newport-Inglewood, Whittier, Chatsworth, Elsinore, Hollywood, Los Alamitos, and Palos Verdes faults. Beyond the known faults, there are a potentially large number of “blind” faults that underlie the surface of Southern California. One such blind fault was involved in the Whittier Narrows earthquake in October 1987.

Although the most widely known fault, the San Andreas, is capable of producing an earthquake with a magnitude of 8+ on the Richter scale, some of the “lesser” faults have the potential to inflict greater damage on the urban core of the Los Angeles Basin. Seismologists believe that a 6.0 earthquake on the Newport-Inglewood would result in far more death and destruction than a “great” quake on the San Andreas, because the San Andreas is relatively remote from the urban centers of Southern California.

For decades, partnerships have flourished between the USGS, Cal Tech, the California Geological Survey and universities to share research and educational efforts with Californians. Tremendous earthquake mapping and mitigation efforts have been made in California in the past two decades, and public awareness has risen remarkably during this time. Major federal, state, and local government agencies and private organizations support earthquake risk reduction, and have made significant contributions in reducing the adverse impacts of earthquakes. Despite the progress, the majority of California communities, including the City of Monterey Park, remain unprepared because there is a general lack of understanding regarding earthquake hazards among Californians and the science of predicting future earthquakes remains a huge challenge.

Table 6-1 - Earthquake Events in the Southern California Region

Southern California Region Earthquakes with a Magnitude of 5.0 or Greater

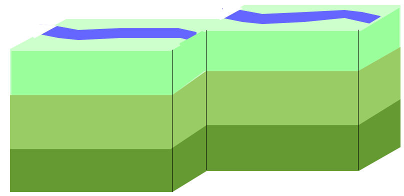
1769 Los Angeles Basin	1916 Tejon Pass Region
1800 San Diego Region	1918 San Jacinto
1812 Wrightwood	1923 San Bernardino Region
1812 Santa Barbara Channel	1925 Santa Barbara
1827 Los Angeles Region	1933 Long Beach
1855 Los Angeles Region	1941 Carpenteria
1857 Great Fort Tejon Earthquake	1952 Kern County
1858 San Bernardino Region	1954 West of Wheeler Ridge
1862 San Diego Region	1971 San Fernando
1892 San Jacinto or Elsinore Fault	1973 Point Mugu
1893 Pico Canyon	1986 North Palm Springs
1894 Lytle Creek Region	1987 Whittier Narrows
1894 San Diego Region	1992 Landers
1899 Lytle Creek region	1992 Big Bear
1899 San Jacinto and Hemet	1994 Northridge
1907 San Bernardino region	1999 Hector Mine
1910 Glen Ivy Hot Springs	

To better understand the earthquake hazard, the scientific community has looked at historical records and accelerated research on those faults that are the sources of the earthquakes occurring in the Southern California region. Historical earthquake records can generally be divided into records of the pre-instrumental period and the instrumental period. In the absence of instrumentation, the detection of earthquakes is based on observations and felt reports, and are dependent upon population density and distribution. Since California was sparsely populated in the 1800s, the detection of pre-instrumental earthquakes is relatively difficult. However, two very large earthquakes, the Fort Tejon in 1857 (7.9) and the Owens Valley in 1872 (7.6) are evidence of the tremendously damaging potential of earthquakes in Southern California. In more recent times two 7.3 earthquakes struck Southern California, in Kern County (1952) and Landers (1992). The damage from these four large earthquakes was limited because they occurred in areas which were sparsely populated at the time they happened. The seismic risk is much more severe today than in the past because the population at risk is in the millions, rather than a few hundred or a few thousand persons.

History of Earthquake Events in Southern California

Since seismologists started recording and measuring earthquakes, there have been tens of thousands of recorded earthquakes in Southern California, most with a magnitude below three. No community in Southern California, including the City of Monterey Park, is beyond the reach of a damaging earthquake. Table 6-1 describes the historical earthquake events that have affected Southern California.

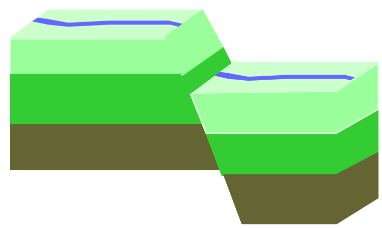
Causes and Characteristics of Earthquakes in Southern California



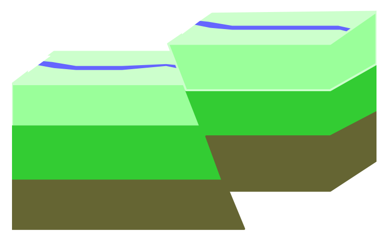
Earthquake Faults

A fault is a fracture between blocks of the earth's crust where either side moves relative to the other along a parallel plane to the fracture.

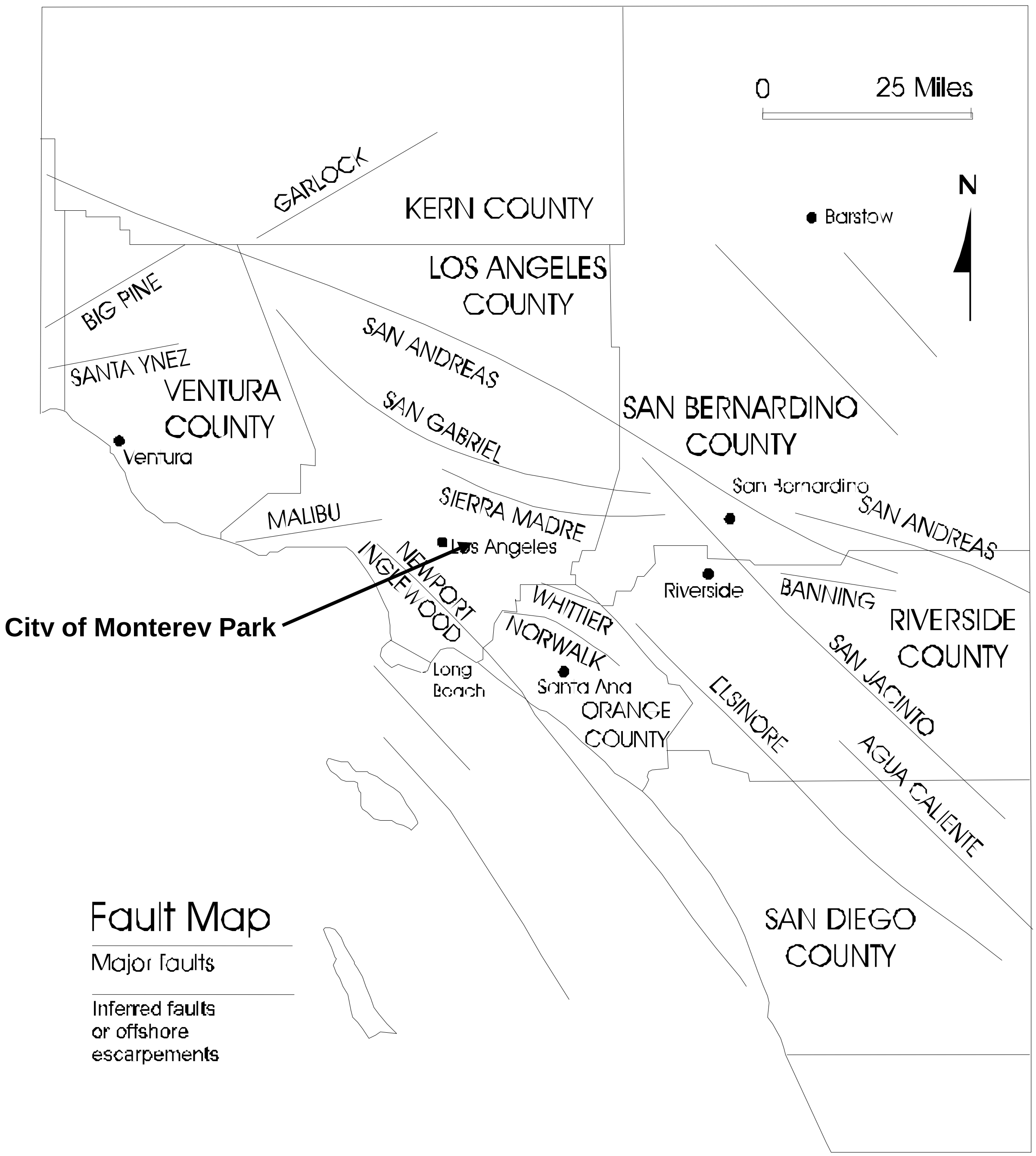
Strike-slip:
Strike-slip faults are vertical or almost vertical rifts where the earth's plates move mostly horizontally. From the observer's perspective, if the opposite block looking across the fault moves to the right, the slip style is called a right lateral fault; if the block moves left, the shift is called a left lateral fault.



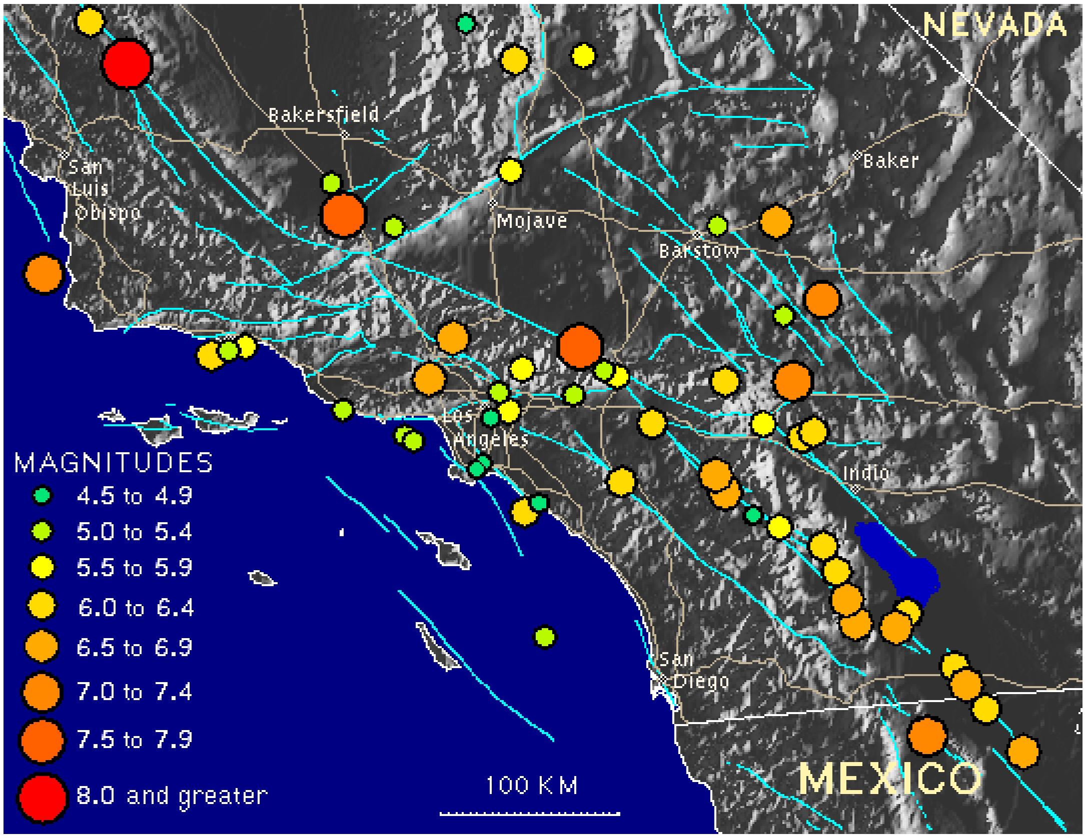
Dip-slip:
Dip-slip faults are slanted fractures where the blocks mostly shift vertically. If the earth above an inclined fault moves down, the fault is called a normal fault, but when the rock above the fault moves up, the fault is called a reverse fault. Thrust faults have a reverse fault with a dip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



Southern California Earthquake Fault Map

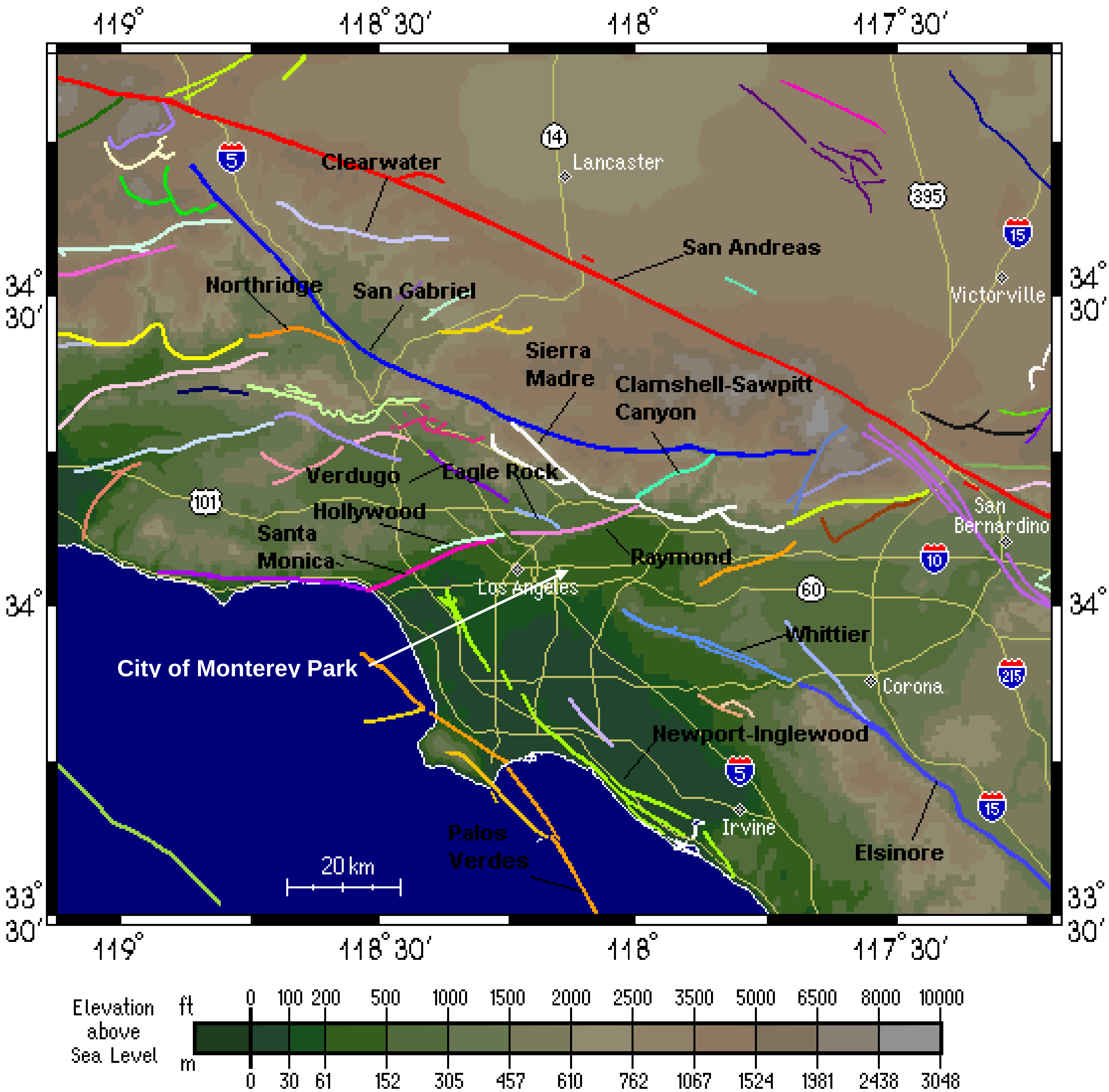


Map of Major Earthquakes in Southern California Since 1812



Dr. Kerry Sieh of Cal Tech has investigated the San Andreas fault at Pallett Creek. "The record at Pallett Creek shows that rupture has recurred about every 130 years, on average, over the past 1500 years. But actual intervals have varied greatly, from less than 50 years to more than 300. The physical cause of such irregular recurrence remains unknown". Damage from a great quake on the San Andreas would be widespread throughout Southern California.

Major Los Angeles Faults



Earthquake Related Hazards

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

Ground Shaking:

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

Earthquake Induced Landslides:

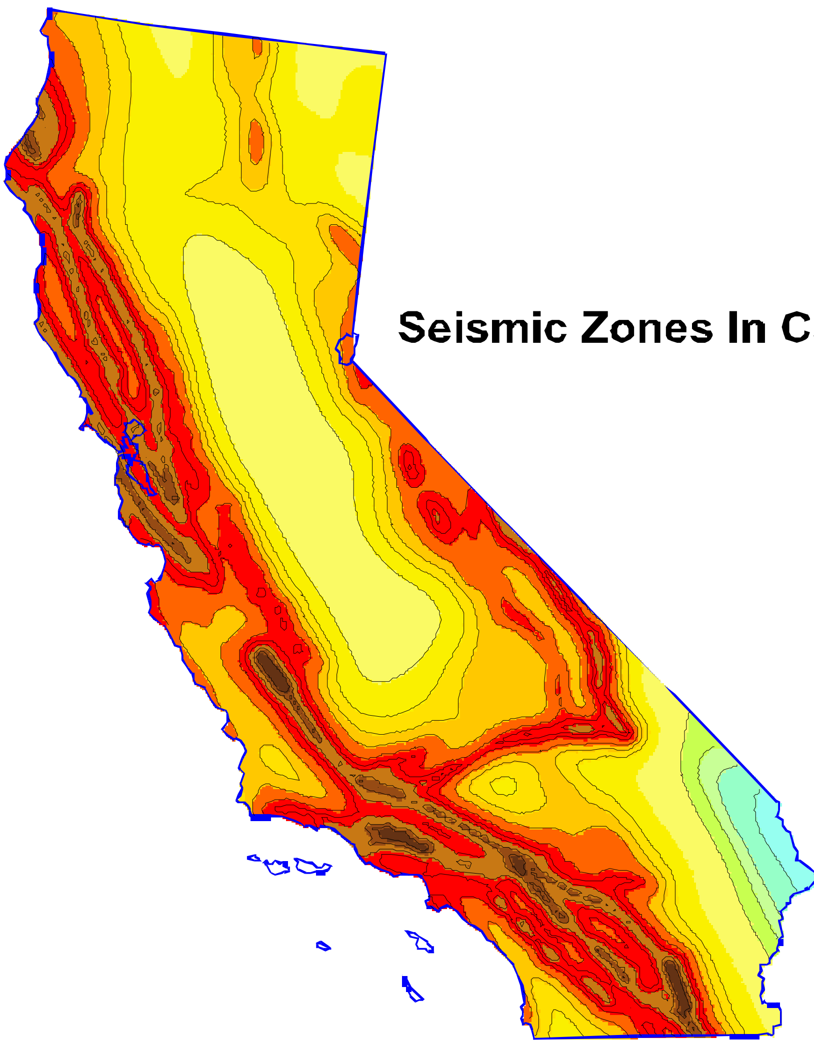
Earthquake induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes. Historically, hillsides in the City of Monterey Park have experienced slope failure due to earthquakes. In particular, steep hill slopes along Abajo Drive failed as a result of the 1987 Whittier Earthquake and have continued to present concerns and threats to private properties and public streets. The California Department of Conservation, Division of Mines and Geology has identified and mapped several pockets of hillside areas within the City that are susceptible to seismically induced landslides (see Appendix H, Seismic Hazard Zone Map dated March 25, 1999).

Liquefaction:

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures. Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases this ground may be subject to liquefaction, depending on the depth of the water table. Historically, liquefaction has not presented a significant hazard in the City of Monterey Park because groundwater levels are low. However, the California Department of Conservation, Division of Mines and Geology has identified the corridor coinciding with Monterey Pass Road between Garvey Avenue and Brightwood Street as being susceptible to seismically induced liquefaction (see Appendix H, Seismic Hazard Zone Map dated March 25, 1999).

Amplification:

Soils and soft sedimentary rocks near the earth's surface can modify ground shaking caused by earthquakes. One of these modifications is amplification. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. Buildings and structures built on soft and unconsolidated soils can face greater risk. Amplification can also occur in areas with deep sediment filled basins and on ridge tops.



Seismic Zones In California

Darker Shaded Areas indicate Greater Potential Shaking

Source: USGS Website

Abridged Modified Mercalli Intensity Scale

Intensity Value and Description		Average Peak Velocity (cm/sec)	Average Peak Acceleration (g = gravity)
	Not felt except by a very few under especially favorable circumstances (I Rossi-Forel scale). Damage potential: None.	<0.1	<0.0017
II.	Felt only by a few persons at rest, especially on upper floors of high-rise buildings. Delicately suspended objects may swing. (I to II Rossi-Forel scale). Damage potential: None.		
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated. (III Rossi-Forel scale). Damage potential: None.		
IV.	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like a heavy truck striking building. Standing automobiles rocked noticeably. (IV to V Rossi-Forel scale). Damage potential: None. Perceived shaking: Light.	1.1 – 3.4	0.014 - 0.039
V.	Felt by nearly everyone, many awakened. Some dishes, windows, and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop. (V to VI Rossi-Forel scale). Damage potential: Very light. Perceived shaking: Moderate.	3.4 – 8.1	0.039-0.092
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved, few instances of fallen plaster and damaged chimneys. Damage slight. (VI to VII Rossi-Forel scale). Damage potential: Light. Perceived shaking: Strong.	8.1 - 16	0.092 -0.18
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars. (VIII Rossi-Forel scale). Damage potential: Moderate. Perceived shaking: Very strong.	16 - 31	0.18 - 0.34
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. (VIII+ to IX Rossi-Forel scale). Damage potential: Moderate to heavy. Perceived shaking: Severe.	31 - 60	0.34 - 0.65
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. (IX+ Rossi-Forel scale). Damage potential: Heavy. Perceived shaking: Violent.	60 - 116	0.65 – 1.24
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks. (X Rossi-Forel scale). Damage potential: Very heavy. Perceived shaking: Extreme.	> 116	> 1.24
XI.	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.		
XII.	Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown into air.		

Earthquake Hazard Assessment

Hazard Identification

In California, many agencies are focused on seismic safety issues: the State's Seismic Safety Commission, the Applied Technology Council, Governor's Office of Emergency Services, United States Geological Survey, Cal Tech, the California Geological Survey as well as a number of universities and private foundations.

These organizations, in partnership with other state and federal agencies, have undertaken a rigorous program in California to identify seismic hazards and risks including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction, and earthquake induced landslides. Seismic hazard maps have been published and are available for many communities in California through the State Division of Mines and Geology. The maps on pages 6-6 and 6-8 illustrate the known earthquake faults in Southern California and the Los Angeles area, respectively.

San Andreas Fault Zone:

The San Andreas fault is the principal boundary between the Pacific and North American plates, and as such, it is considered the "Master Fault" because it has frequent (geologically speaking), large, earthquakes, and it controls the seismic hazard in southern California. The fault extends over 1,000 miles (1,600 kilometers) from near Cape Mendocino in northern California to the Salton Sea region in southern California. At its closest approach, the San Andreas fault is approximately 21 miles (33 km) north of Monterey Park.

Large faults, such as the San Andreas fault, are generally divided into segments in order to evaluate their future earthquake potential. The segments are generally defined at discontinuities along the fault that may affect the rupture length. In central and southern California, the San Andreas fault zone is divided into five segments named, from north to south, the Cholame, Carrizo, Mojave, San Bernardino Mountains, and Coachella Valley segments (WGCEP, 1995). Each segment is assumed to have a characteristic slip rate (rate of movement averaged over time), recurrence interval (time between moderate to large earthquakes), and displacement (amount of offset during an earthquake). While this methodology has some value in predicting earthquakes, historical records and studies of prehistoric earthquakes show that it is possible for more than one segment to rupture during a large quake or for ruptures to overlap into adjacent segments.

The last major earthquake on the southern portion of the San Andreas fault was the 1857 Fort Tejon (M 8) event. This is the largest earthquake reported in California. The 1857 surface rupture broke the Cholame, Carrizo, and Mojave segments, resulting in displacements of as much as 27 feet (9 meters) along the rupture zone. Peak ground accelerations in the San Gabriel Valley area as a result of the 1857 earthquake are estimated to have been as high as 0.23g. These fault segments are thought to have a recurrence interval of between 104 and 296 years.

The Mojave segment of the San Andreas fault is 83 miles (133 km) long, extending from approximately Three Points southward to just northwest of Cajon Creek, at the southern limit of the 1857 rupture (WGCEP, 1995). Using a slip rate of 30±8 millimeters per year (mm/yr) and a characteristic displacement of 4.5±1.5 meters (m), the WGCEP (1995) derived a recurrence interval of 150 years for this segment. The Mojave segment is estimated to be capable of producing a magnitude 7.1 earthquake, which could result in peak ground accelerations in the Monterey Park area of between 0.13g and 0.16g. The WGCEP (1995) calculated that this segment has a 26 percent probability of rupturing sometime between 1994 and 2024.

The San Bernardino Mountains segment extends approximately 49 miles (78 km) from Cajon Creek to the San Gorgonio Pass. This segment is a structurally complex zone that is poorly understood, and for which there are scant data on fault behavior. Using a slip rate of 24±5 mm/yr and a characteristic displacement of 3.5±1.0 m, the 1995 WGCEP derived a recurrence interval on this fault of 146 years. This fault segment is estimated capable of producing a magnitude 7.3 earthquake, which could result in peak ground accelerations in San Gabriel of between 0.11g and 0.13g. If this fault segment ruptures together with the Mojave and Coachella Valley segments, higher ground motions would be expected. In 1994, the WGCEP (1995) calculated that this fault segment had a 28 percent probability of rupturing sometime in the next 30 years.

The Coachella Valley segment is about 71 miles (114 km) long and extends from San Gorgonio Pass to the Salton Sea. This segment has not produced any large surface-rupturing earthquakes in historic times (Sieh and Williams, 1990). Paleoseismic studies suggest that the last surface-rupturing earthquake on this segment occurred around 1680. The data also suggest that during the 1680 earthquake, and the one prior to that, in 1450, both the Coachella Valley and San Bernardino Mountain segments ruptured simultaneously. Using a slip rate of 25± 5mm/yr and a characteristic displacement of 4.0 (+4,-2) m, the 1995 WGCEP derived a recurrence interval for this fault of 220 ±13 years. This segment is thought capable of producing a magnitude 7.4 earthquake, which could result in peak ground accelerations in the Monterey Park area of 0.12g to 0.13 g. The WGCEP (1995) also calculated a 22 percent probability that this fault segment will generate an earthquake sometime between 1994 and 2024.

Sierra Madre Fault:

The Sierra Madre fault zone is a north-dipping reverse fault zone approximately 47 miles (75 km) long that extends along the southern flank of the San Gabriel Mountains from San Fernando to San Antonio Canyon, where it continues southeastward as the Cucamonga fault. The Sierra Madre fault has been divided into five segments, and each segment seems to have a different rate of activity.

The northwestern-most segment of the Sierra Madre fault (the San Fernando segment) ruptured in 1971, causing the M_w 6.7 San Fernando (or Sylmar) earthquake. As a result of this earthquake, the Sierra Madre fault has been known to be active. In the 1980s, Crook and others (1987) studied the Transverse Ranges using general geologic and geomorphic mapping, coupled with a few trenching locations, and suggested that the segments of the Sierra Madre fault east of the San Fernando segment have not generated major earthquakes in several thousands of years, and possibly as long as 11,000 years. By California's definitions of active faulting, most of the Sierra Madre fault would therefore be classified as not active. Then, in the mid 1990s, Rubin and others (1998) trenched a section of the Sierra Madre fault in Altadena (at Loma Alta Park, see Plate 1-2), and determined that this segment has ruptured at least twice in the last 15,000 years, causing magnitude 7.2 to 7.6 earthquakes. This suggests that the Los Angeles area is susceptible to infrequent, but large near-field earthquakes on the Sierra Madre fault. Rubin et al.'s (1998) trenching data show that during the last earthquake, this fault trace shifted as much as 13 feet (4 meters) at the surface, and that total displacement in the last two events adds to more than 34 feet (10.5 meters)!

Although the fault seems to slip at a rate of only about 0.6 mm/yr, over time, it can accumulate a significant amount of strain. The paleoseismic data obtained at the Loma Alta Park site were insufficient to estimate the recurrence interval and the age of the last surface-rupturing event on this segment of the fault. However, Tucker and Dolan (2001) trenched the east Sierra Madre fault at Horsethief Canyon and obtained data consistent with Rubin et al.'s (1998) findings. At Horsethief Canyon, the Sierra Madre fault last ruptured more than 8,000 years ago. Thus, using a slip rate of 0.6 mm/yr and a slip per event of 5 meters, we can calculate a recurrence interval of about 8,000 years. If the last event occurred more than 8,000 years ago, it is possible that these segments of the Sierra Madre fault are near the end of their cycle, and therefore likely to generate an earthquake in the not too distant future.

Verdugo Fault:

The Verdugo fault is a 13-mile (21 km) long, southeast-striking fault that that lies along the southern flank of the Verdugo Mountains, near Burbank. The fault has been interpreted as both a reverse fault (Wesnousky, 1986), and a left-lateral strike-slip fault (Walls et al., 1998). Weber et al. (1980) first reported southwest-facing scarps 2 to 3 meters high in the alluvial fan deposits in the Burbank and West Glendale areas, and other subsurface features indicative of faulting. Since Weber et al.'s study (1980), no additional surface data on this fault has been published. Recently, however, several investigators began reviewing the subsurface geology in this area (Tsutsumi and Yeats, 1999; Langenheim et al., 2000; Pujol et al., 2001). Results of these studies suggest that the Verdugo fault changes in character from a reverse fault adjacent to the Pacoima Hills, to a normal fault at the southwest edge of the Verdugo Mountains. Vertical separation on the fault is at least 1000 meters (Tsutsumi and Yeats, 1999).

Clearly, additional studies will be required to resolve these inconsistencies in the style of faulting. Given its location near highly populated portions of the Los Angeles metropolitan area, several investigations, including trenching of the fault, are likely to be conducted in the next few years to better define this fault's seismic hazard.

Slip rate on the Verdugo fault is poorly constrained, and currently estimated at about 0.5 mm/yr (CGS, previously CDMG, 1996). The fault's recurrence interval is unknown. The southern segment of the fault is thought to have ruptured during the Holocene, therefore, the fault is considered active (Jennings, 1994). Based on its length, the Verdugo fault is thought capable of generating magnitude 6.0 to 6.8 earthquakes. A magnitude 6.7 earthquake on this fault would generate peak ground accelerations in the San Gabriel Valley area of between 0.53g and 0.64g.

Elysian Park Fault:

The Whittier Narrows earthquake of October 1, 1987 occurred on a previously unknown blind thrust fault underneath the eastern part of the Los Angeles basin. Davis et al. (1989) used oil field data to construct cross-sections showing the subsurface geology of the basin, and concluded that the Whittier Narrows earthquake occurred on a thrust ramp they called the Elysian Park thrust fault. They modeled the Elysian Park as a shallow-angle, reverse-motion fault 6 to 10 miles below the ground surface generally located between the Whittier fault to the southeast, and the Hollywood fault to the west-northwest. Although blind thrusts do not extend to the Earth's surface, they are typically expressed at the surface by a series of hills or mountains. Davis et al. (1989) indicated that the Elysian Park thrust ramp is expressed at the surface by the Santa Monica Mountains, and the Elysian, Repetto, Montebello and Puente Hills.

Davis et al. (1989) estimated a long-term slip rate on the Elysian Park of between 2.5 and 5.2 mm/yr. Dolan et al. (1995) used a different approach to estimate a slip rate on the Elysian Park fault of about 1.7 mm/yr with a recurrence interval of about 1,475 years. Then, in 1996, Shaw and Suppe re-interpreted the subsurface geology of the Los Angeles basin, proposed a new model for what they call the Elysian Park trend, and estimated a slip rate on the thrust ramp beneath the Elysian Park trend of 1.7±0.4 mm/yr. More recently, Shaw and Shearer (1999) relocated the main shock and aftershocks of the 1987 Whittier Narrows earthquake, and showed that the earthquake sequence occurred on an east-west trending buried thrust they called the Puente Hills thrust (rather than the northwest-trending Elysian Park thrust).

Raymond Fault:

The Raymond fault is a left-lateral, strike-slip fault about 13 miles (20 km) long that extends across the San Gabriel Valley. The fault is arcuate in shape, trending east-west in its western section, and east-northeast in its eastern section. The fault produces a very obvious south-facing scarp along much of its length, which led many geologists to favor reverse-slip as the predominant sense of fault motion. However, left-deflected channels, shutter-ridges, sag ponds, and pressure ridges indicate that the Raymond fault is predominantly a left-lateral strike-slip fault. This sense of motion is confirmed by the seismological record, especially the mainshock and aftershock sequence to the 1988 Pasadena earthquake of local magnitude (M_L) 5.0 that probably occurred on this fault (Jones et al., 1990; Hauksson and Jones, 1991).

The Raymond fault appears to transfer slip southward from the Sierra Madre fault zone to other fault systems.

The Raymond fault was recently trenched in San Marino, and at the Los Angeles Arboretum in Arcadia (Weaver and Dolan, 2000), where significant data on the recent history of this fault were collected. These studies indicate that the most recent surface-rupturing earthquake on this fault occurred 1,000 to 2,000 years ago, and that between three and five earthquakes occurred on this fault between 41,500 and 31,500 years ago. This suggests that the fault either breaks in cluster earthquakes, or that several more surface-rupturing earthquakes have occurred on this fault that have not been detected in the trenches. Weaver and Dolan (2000) also indicate that the Raymond fault may rupture alone, or together with other nearby faults, such as the Hollywood fault. A strike-slip rate of 4 (+1, -0.5) mm/yr on the Raymond fault was recently estimated from paleoseismic data (Marin et al., 2000; Dolan et al., in review).

In California, each earthquake is followed by revisions and improvements in the Building Codes.

The 1933 Long Beach resulted in the Field Act, affecting school construction. The 1971 Sylmar earthquake brought another set of increased structural standards. Similar re-evaluations occurred after the 1989 Loma Prieta and 1994 Northridge earthquakes. These code changes have resulted in stronger and more earthquake resistant structures.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. The State Department of Conservation operates the Seismic Mapping Program for California. Extensive information is available at their website:
http://gmw.consrv.ca.gov/shmp/index.htm

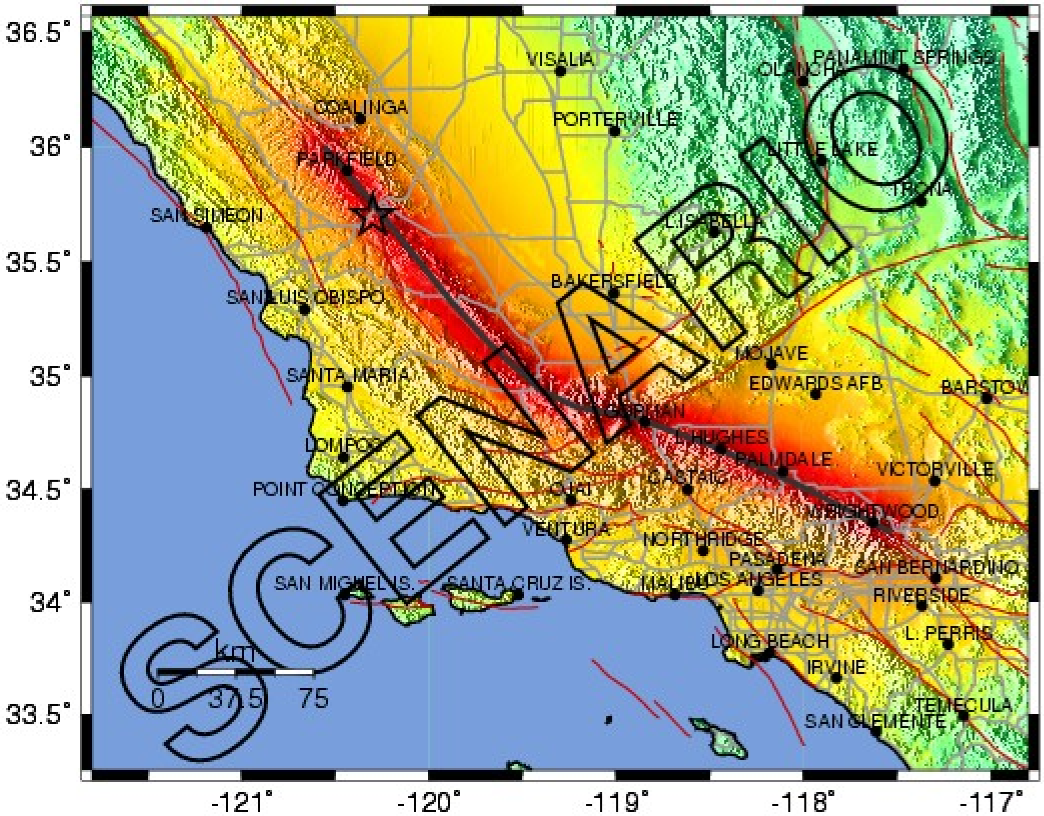
No active faults have been identified at the ground surface within the City of Monterey Park limits, nor have any Alquist-Priolo Earthquake Fault zones been designated. However, the City overlies a number of blind thrust faults. The faults are referred to as blind because they do not intercept the ground surface and therefore cannot be detected visually. These northwest-dipping low-angle faults include the Puente Hills thrust, the Elysian Park thrust, and the East Los Angeles thrust (shallowest to deepest). These faults are capable of movement that could produce substantial ground shaking.

As discussed above, ground shaking potential can be expressed qualitatively using the Modified Mercalli Scale or quantitatively by the PHGA (peak horizontal ground acceleration). The PGHA value is calculated based upon the so-called maximum credible earthquake, or the seismic event considered likely to occur on an active fault affecting the City. In the City of Monterey Park, the Los Angeles segment of the Puente Hills blind thrust fault represents the controlling force for calculating the PGHA. Assuming a magnitude 6.5 earthquake on this fault, the best PGHA estimate is 0.5 g for loose soils (alluvium) and 0.55 g for bedrock. This level of ground shaking translates to an approximate Modified Mercalli Scale intensity of IX for the entire City.

A major earthquake produced along any of the regional fault systems has the potential to produce strong ground shaking in Monterey Park. Experience from the Whittier Narrows (1987) and Northridge (1994) earthquakes has shown that ridge top locations in the City and locations near the margins of alluvial basins may be susceptible to elevated levels of ground shaking.

Seismic risks associated with both regional fault systems and the local blind thrust faults underlying the City of Monterey Park emphasize the need to ensure that all new development projects - and the retrofit of existing structures - incorporate appropriate design features to guard against widespread property damage and loss of life in the event of an earthquake.

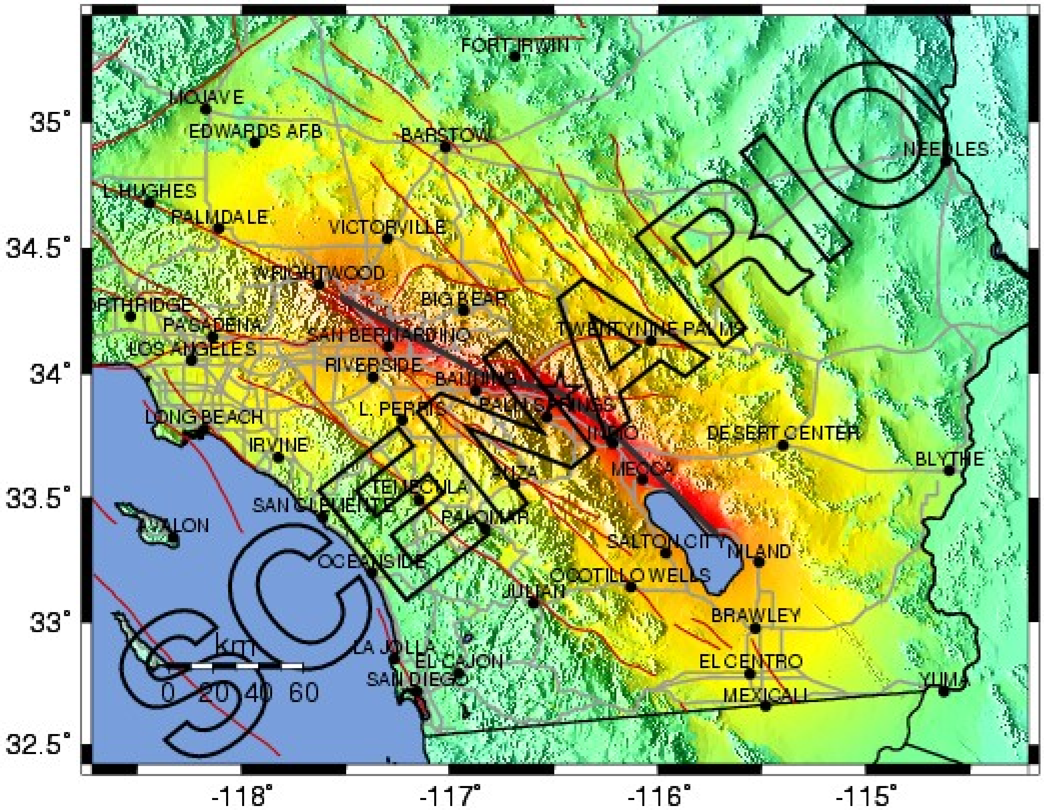
-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for San Andreas 1857 rupture Scenario
Scenario Date: Fri Feb 15, 2002 08:00:00 AM PST M 7.8 N35.70 W120.30 Depth: 10.0km



PLANNING SCENARIO ONLY -- Processed: Mon Jan 12, 2004 04:55:46 PM PST

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for San Andreas southern rupture Scenario
Scenario Date: Wed Nov 14, 2001 04:00:00 AM PST M 7.4 N33.92 W116.47 Depth: 10.0km



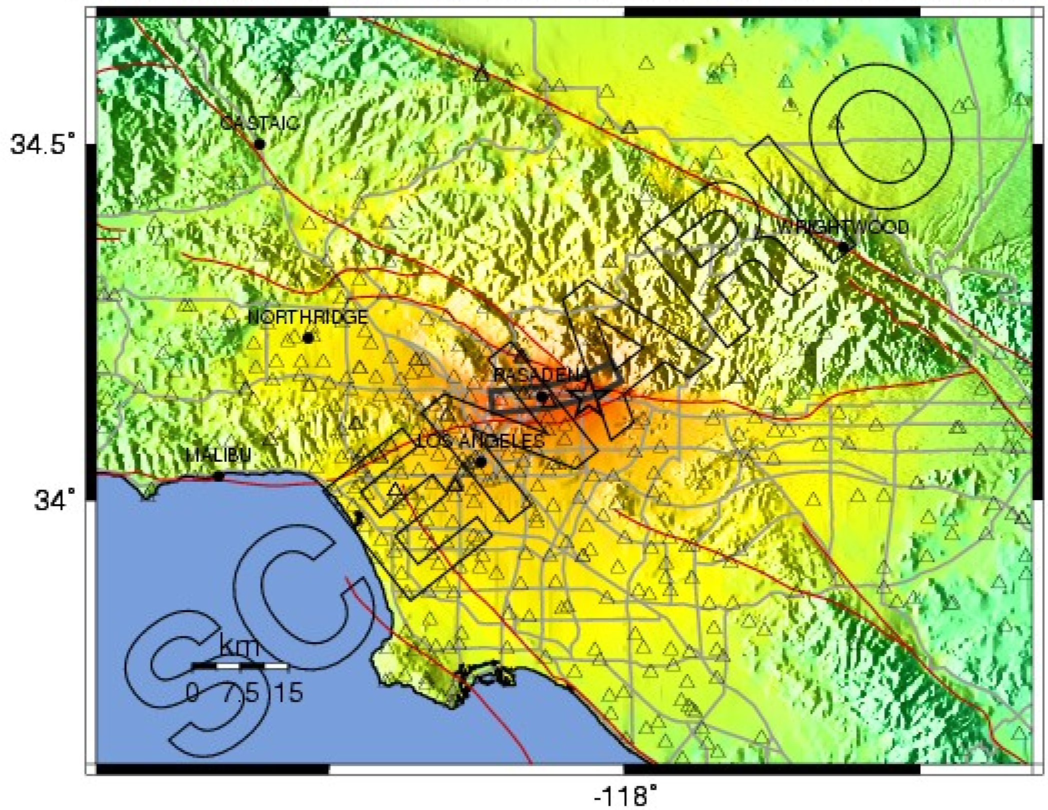
PLANNING SCENARIO ONLY -- Processed: Mon Jan 12, 2004 10:55:42 AM PST

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

-- Earthquake Planning Scenario --

Rapid Instrumental Intensity Map for Raymond Fault M6.5 Scenario

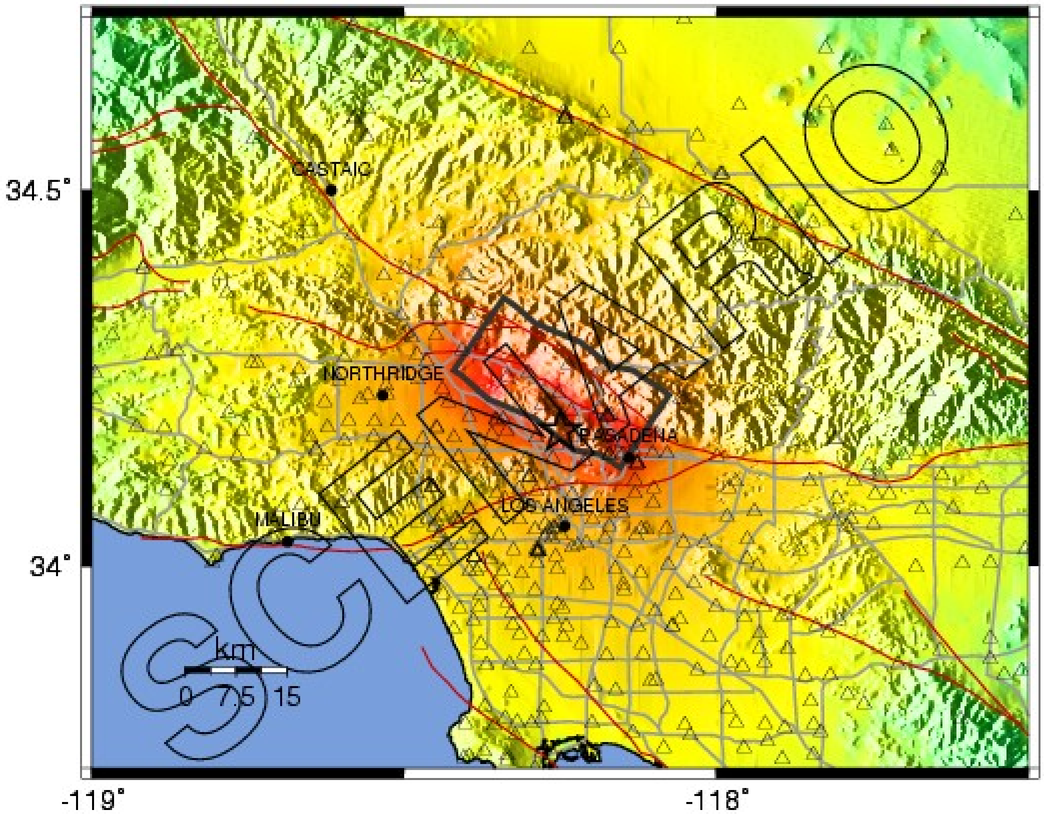
Scenario Date: Thu Apr 4, 2002 09:15:00 AM PST M 6.5 N34.14 W118.06 Depth: 13.0km



PLANNING SCENARIO ONLY -- Processed: Wed Jul 7, 2004 10:51:50 PM PDT

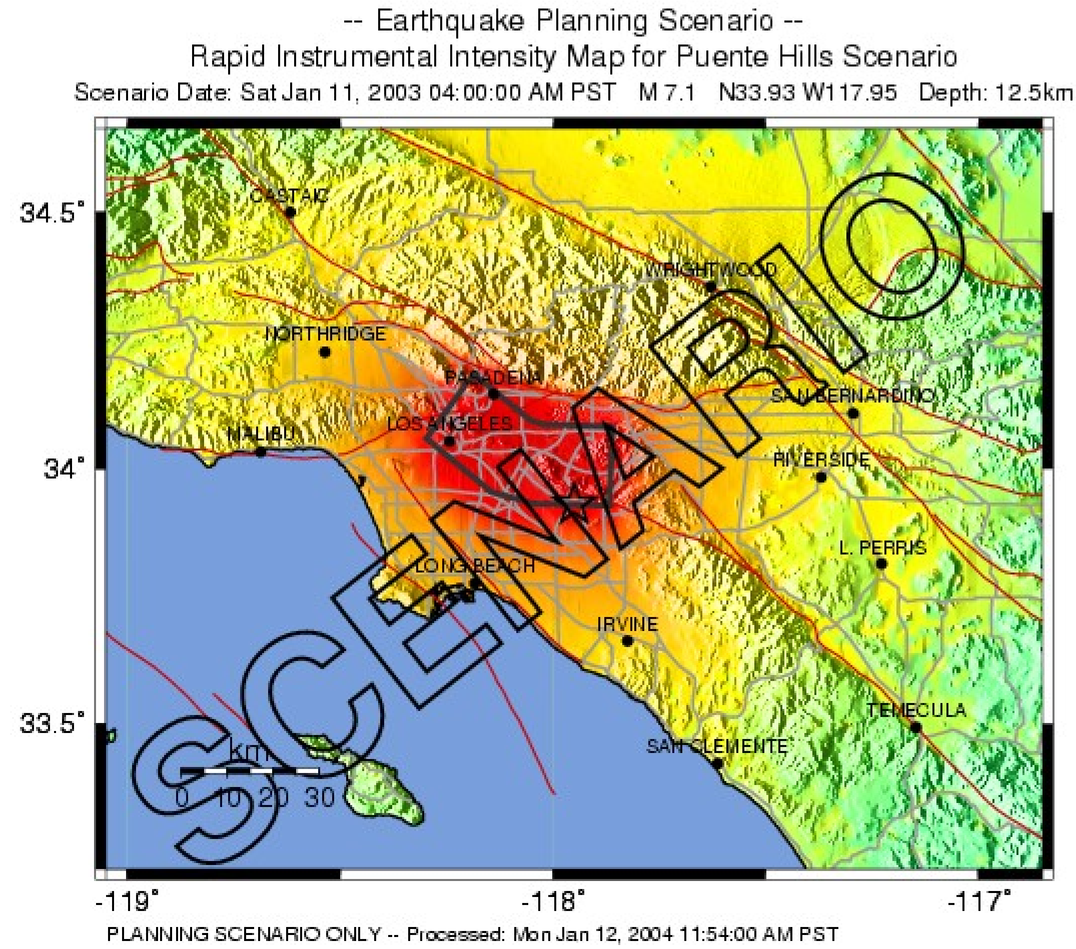
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for Verdugo Fault M6.7 Scenario
Scenario Date: Tue Oct 30, 2001 04:00:00 AM PST M 6.7 N34.18 W118.25 Depth: 6.0km



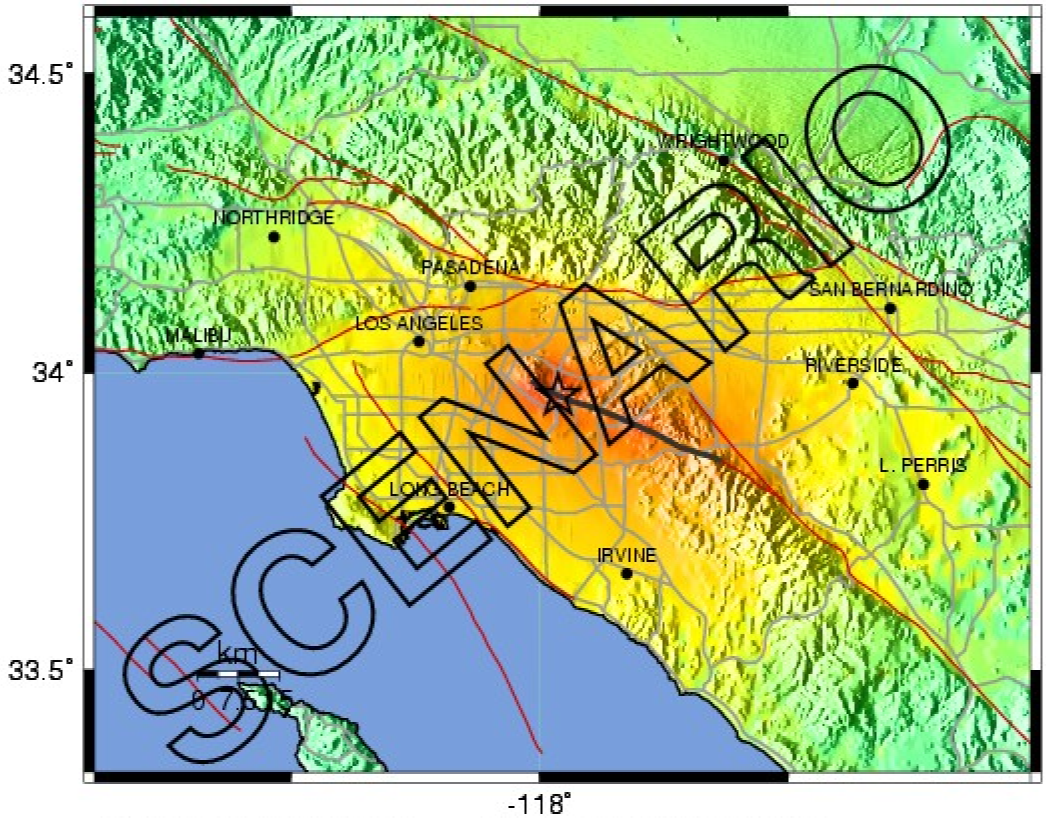
PLANNING SCENARIO ONLY -- Processed: Wed Jul 7, 2004 11:01:41 PM PDT

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



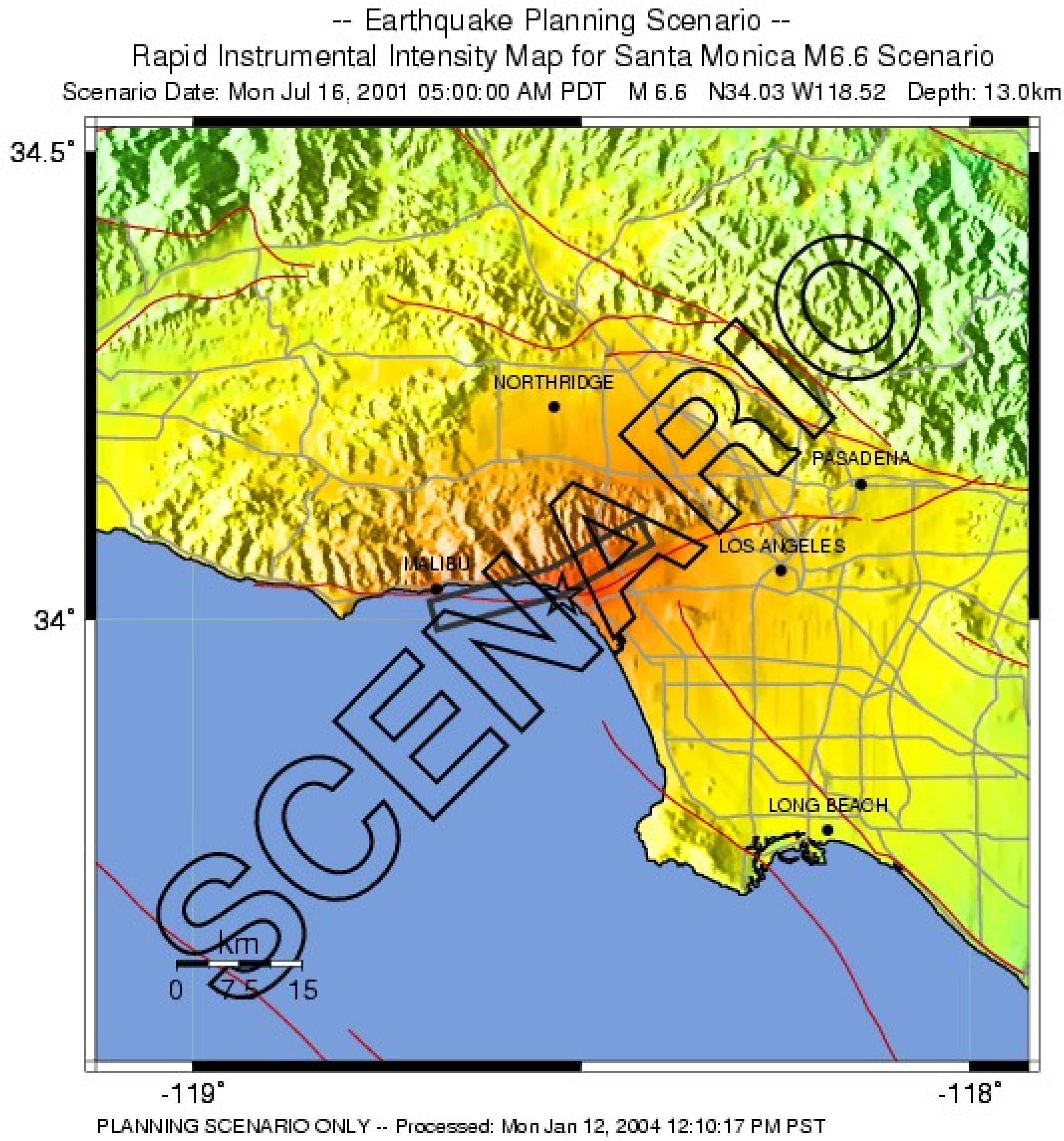
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for Whittier M6.8 Fault Scenario
Scenario Date: Mon Mar 11, 2002 04:00:00 AM PST M 6.8 N33.96 W117.96 Depth: 10.0km



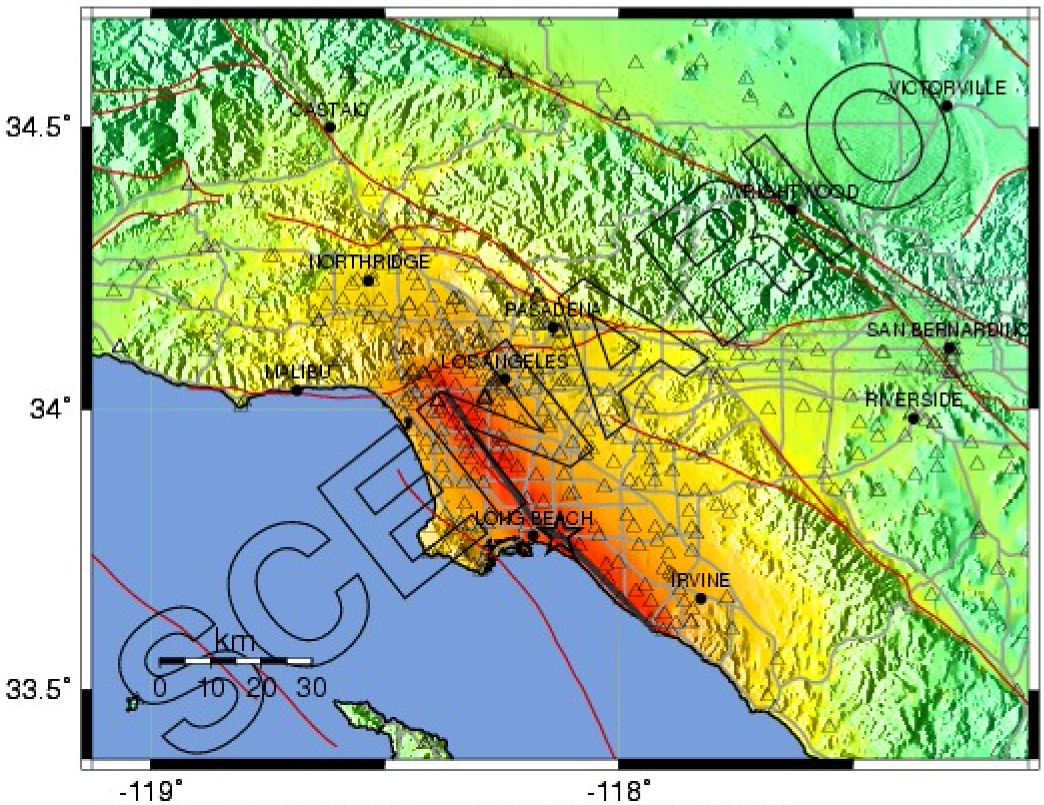
PLANNING SCENARIO ONLY -- Processed: Mon Jan 12, 2004 11:36:25 AM PST

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for Newport-Inglewood M6.9 Scenario
Scenario Date: Fri Aug 3, 2001 05:00:00 AM PDT M 6.9 N33.78 W118.13 Depth: 6.0km



PLANNING SCENARIO ONLY -- Processed: Wed Jul 7, 2004 10:40:47 PM PDT

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Vulnerability Assessment

The effects of earthquakes span a large area, and large earthquakes occurring in many parts of the Southern California region would probably be felt in the City of Monterey Park and throughout the region. However, the degree to which the earthquakes are felt, and the damages associated with them may vary. At risk from earthquake damage are large stocks of old buildings and bridges: many high tech and hazardous materials facilities: extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; and other critical facilities and private property located in the City. The relative or secondary earthquake hazards, which are liquefaction, ground shaking, amplification, and earthquake-induced landslides, can be just as devastating as the earthquake.

The California Geological Survey has identified areas most vulnerable to liquefaction. Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures.

Southern California has many active landslide areas, and a large earthquake could trigger accelerated movement in these slide areas, in addition to jarring loose other unknown areas of landslide risk.

Risk Analysis

Risk analysis is the third phase of a hazard assessment. Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time. Factors included in assessing earthquake risk include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure, and disaster preparedness of the region. This type of analysis can generate estimates of the damages to the region due to an earthquake event in a specific location. FEMA's software program, HAZUS, uses mathematical formulas and information about building stock, local geology and the location and size of potential earthquakes, economic data, and other information to estimate losses from a potential earthquake. The HAZUS software is available from FEMA at no cost.

For greater Southern California there are multiple worst-case scenarios, depending on which fault might rupture, and which communities are in proximity to the fault. But damage will not necessarily be limited to immediately adjoining communities. Depending on the hypocenter of the earthquake, seismic waves may be transmitted through the ground to unsuspecting communities. In the Northridge 1994 earthquake, Santa Monica suffered extensive damage, even though there was a range of mountains between it and the origin of the earthquake.

Damages for a large earthquake almost anywhere in Southern California, including the City of Monterey Park, are likely to run into the billions of dollars. Although building codes are some of the most stringent in the world, ten's of thousands of older existing buildings were built under much less rigid codes. California has laws affecting unreinforced masonry buildings (URM's) and although many building owners have retrofitted their buildings, hundreds of pre-1933 buildings still have not been brought up to current standards. The City of Monterey Park has a small number of un-reinforced masonry buildings, all of which have be retrofitted to an acceptable seismic standard.

Non-structural bracing of equipment and contents is often the most cost-effective type of seismic mitigation. Inexpensive bracing and anchoring may be the most cost effective way to protect expensive equipment. Non-structural bracing of equipment and furnishings will also reduce the chance of injury for the occupants of a building.

Community Earthquake Issues

What is Susceptible to Earthquakes?

Earthquake damage occurs because humans have built structures that cannot withstand severe shaking. Buildings, airports, schools, and lifelines (highways and utility lines) suffer damage in earthquakes and can cause death or injury to humans. The welfare of homes, major businesses, and public infrastructure is very important. Addressing the reliability of buildings, critical facilities, and infrastructure, and understanding the potential costs to government, businesses, and individuals as a result of an earthquake, are challenges faced by the City of Monterey Park.

Dams:

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

A list of the largest reservoirs in Los Angeles County, which includes the Garvey Reservoir in the City of Monterey Park, is provided in Appendix G.

Buildings:

The built environment, which includes over 20,000 housing units and over 1,000 commercial, industrial, and institutional buildings, is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk and the cost to clean up the damages is great. In most California communities, including the City of Monterey Park, many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings.

Infrastructure and Communication:

Residents in the City of Monterey Park commute frequently by automobiles and public transportation such as buses and light rail. An earthquake can greatly damage bridges and roads, hampering emergency response efforts and the normal movement of people and goods. Damaged infrastructure strongly affects the economy of the community because it disconnects people from work, school, food, and leisure, and separates businesses from their customers and suppliers,

Bridge Damage:

Even modern bridges can sustain damage during earthquakes, leaving them unsafe for use. Some bridges have failed completely due to strong ground motion. Bridges are a vital transportation link - with even minor damages making some areas inaccessible. Because bridges vary in size, materials, location and design, any given earthquake will affect them differently. Bridges built before the mid-1970' s have a significantly higher risk of suffering structural damage during a moderate to large earthquake compared with those built after 1980 when design improvements were made.

Much of the interstate highway system was built in the mid to late 1960's. The bridges in the City of Monterey Park are state, county or privately owned (including railroad bridges). Cal Trans has retrofitted most bridges on the freeway systems; however there are still some county maintained bridges that are not retrofitted. The FHWA requires that bridges on the National Bridge Inventory be inspected every 2 years. CalTrans checks when the bridges are inspected because they administer the Federal funds for bridge projects.

Damage to Lifelines:

Lifelines are the connections between communities and outside services. They include water and gas lines, transportation systems, electricity and communication networks. Ground shaking and amplification can cause pipes to break open, power lines to fall, roads and railways to crack or move, and radio and telephone communication to cease. Damage to the City's water supply infrastructure is of particular concern and is discussed in detail in Section 12 of this plan. Disruption to transportation makes it especially difficult to bring in supplies or services.

Lifelines need to be usable after an earthquake to allow for rescue, recovery, and rebuilding efforts and to relay important information to the public.

Disruption of Critical Services:

Critical facilities include police stations, fire stations, hospitals, shelters, and other facilities that provide important services to the community. These facilities and their services need to be functional after an earthquake event. Critical facilities may be housed in older buildings that are not up to current seismic codes.

Businesses:

Seismic activity can cause great loss to businesses, both large-scale corporations and small retail shops. When a company is forced to stop production for just a day, the economic loss can be tremendous, especially when its market is at a national or global level. Seismic activity can create economic loss that presents a burden to large and small shop owners who may have difficulty recovering from their losses.

Forty percent of businesses do not reopen after a disaster and another twenty-five percent fail within one year according to the Federal Emergency Management Agency (FEMA). Similar statistics from the United States Small Business Administration indicate that over ninety percent of businesses fail within two years after being struck by a disaster.

Individual Preparedness:

Because the potential for earthquake occurrences and earthquake related property damage is relatively high in the City of Monterey Park, increasing individual preparedness is a significant need. Strapping down heavy furniture, water heaters, and expensive personal property, as well as being earthquake insured, and anchoring buildings to foundations are just a few steps individuals can take to prepare for an earthquake.

Death and Injury:

Death and injury can occur both inside and outside of buildings due to collapsed buildings falling equipment, furniture, debris, and structural materials. Downed power lines and broken water and gas lines can also endanger human life,

Fire:

Downed power lines or broken gas mains can trigger fires. When fire stations suffer building or lifeline damage, quick response to extinguish fires is less likely. Furthermore, major incidents will demand a larger share of resources, and initially smaller fires and problems will receive little or insufficient resources in the initial hours after a major earthquake event. Loss of electricity may cause a loss of water pressure in some communities, further hampering fire fighting ability.

Debris:

After damage to a variety of structures, much time is spent cleaning up brick, glass, wood, steel or concrete building elements, office and home contents, and other materials. Developing a strong debris management strategy is essential in post-disaster recovery. Occurrence of a disaster does not exempt the City of Monterey Park from compliance with AB 939 which addresses solid waste management issues.

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are being implemented by county, regional, state, or federal agencies or organizations.

City of Monterey Park Codes:

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

The following sections of the UBC address the earthquake hazard:

1605, 1 (Distribution of Horizontal Sheer);
1605. 2 (Stability against Overturning);
1626 (Seismic);
1605. 3 (Anchorage); and
1632 , 1633, 1633. 9 deal with specific earthquake hazards.

The City of Monterey Park Planning Department enforces the zoning and land use regulations relating to earthquake hazards.

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

Coordination Among Building Officials:

The City of Monterey Park Building Code sets the minimum design and construction standards for new buildings. The City of Monterey Park has adopted the most recent seismic standards in its building code, which requires that new buildings be built at a higher seismic standard.

The City of Monterey Park also requires that site-specific seismic hazard investigations be performed for new essential facilities, major structures, hazardous facilities, and special occupancy structures such as schools, hospitals, and emergency response facilities.

Businesses/Private Sector:

Natural hazards have a devastating impact on businesses. In fact, of all businesses which close following a disaster, more than forty-three percent never reopen, and an additional twenty-nine percent close for good within the next two years. The Institute for Business and Home Safety has developed “Open for Business”, which is a disaster planning toolkit to help guide businesses in preparing for and dealing with the adverse affects natural hazards (www.ibhs.org). The kit integrates protection from natural disasters into the company's risk reduction measures to safeguard employees, customers, and the investment itself. The guide helps businesses secure human and physical resources during disasters, and helps to develop strategies to maintain business continuity before, during, and after a disaster occurs.

Hospitals:

“The Alfred E. Alquist Hospital Seismic Safety Act (“Hospital Act”) was enacted in 1973 in response to the moderate Magnitude 6.6 Sylmar Earthquake in 1971 when four major hospital campuses were severely damaged and evacuated. Two hospital buildings collapsed killing forty seven people. Three others were killed in another hospital that nearly collapsed.

In approving the Act, the Legislature noted that:
Hospitals, that house patients who have less than the capacity of normally healthy persons to protect themselves, and that must be reasonably capable of providing services to the public after a disaster, shall be designed and constructed to resist, insofar as practical, the forces generated by earthquakes, gravity and winds. (Health and Safety Code Section 129680)

When the Hospital Act was passed in 1973, the State anticipated that, based on the regular and timely replacement of aging hospital facilities, the majority of hospital buildings would be in compliance with the Act’s standards within 25 years. However, hospital buildings were not, and are not, being replaced at that anticipated rate. In fact, the great majority of the State’s urgent care facilities are now more than 40 years old.

The moderate Magnitude 6.7 Northridge Earthquake in 1994 caused $3 billion in hospital-related damage and evacuations. Twelve hospital buildings constructed before the Act were cited (red tagged) as unsafe for occupancy after the earthquake. Those hospitals that had been built in accordance with the 1973 Hospital Act were very successful in resisting structural damage. However, nonstructural damage (for example, plumbing and ceiling systems) was still extensive in those post-1973 buildings.

Senate Bill 1953 ("SB 1953"), enacted in 1994 after the Northridge Earthquake, expanded the scope of the 1973 Hospital Act. Under SB 1953, all hospitals are required, as of January 1, 2008, to survive earthquakes without collapsing or posing the threat of significant loss of life.

The 1994 Act further mandates that all existing hospitals be seismically evaluated, and retrofitted, if needed, by 2030, so that they are in substantial compliance with the Act (which requires that the hospital buildings be reasonably capable of providing services to the public after disasters). SB 1953 applies to all urgent care facilities (including those built prior to the 1973 Hospital Act) and affects approximately 2,500 buildings on 475 campuses.

SB 1953 directed the Office of Statewide Health Planning and Development ("OSHPD"), in consultation with the Hospital Building Safety Board, to develop emergency regulations including "…earthquake performance categories with subgradations for risk to life, structural soundness, building contents, and nonstructural systems that are critical to providing basic services to hospital inpatients and the public after a disaster." (Health and Safety Code Section 130005)

The Seismic Safety Commission Evaluation of the State's Hospital Seismic Safety Policies:

In 2001, recognizing the continuing need to assess the adequacy of policies, and the application of advances in technical knowledge and understanding, the California Seismic Safety Commission created an Ad Hoc Committee to re-examine the compliance with the Alquist Hospital Seismic Safety Act. The formation of the Committee was also prompted by the recent evaluations of hospital buildings reported to OSHPD that revealed that a large percentage (40%) of California's operating hospitals are in the highest category of collapse risk."

California Earthquake Mitigation Legislation

California is painfully aware of the threats it faces from earthquakes. Dating back to the 19th century, Californians have been killed, injured, and lost property as a result of earthquakes. As the State's population continues to grow, and urban areas become even more densely built up, the risk will continue to increase. For decades the Legislature has passed laws to strengthen the built environment and protect the citizens. The table below provides a sampling of some of the 200 plus laws in the State's codes.

Partial List of the Over 200 California Laws on Earthquake Safety

Government Code Section 8870-8870.95	Creates Seismic Safety Commission.
Government Code Section 8876.1-8876.10	Established the California Center for Earthquake Engineering Research.
Public Resources Code Section 2800-2804.6	Authorized a prototype earthquake prediction system along the cental San Andreas fault near the City of Parkfield.
Public Resources Code Section 2810-2815	Continued the Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project.
Health and Safety Code Section 16100-16110	The Seismic Safety Commission and State Architect, will develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings.
Government Code Section 8871-8871.5	Established the California Earthquake Hazards Reduction Act of 1986.
Health and Safety Code Section 130000-130025	Defined earthquake performance standards for hospitals.
Public Resources Code Section 2805-2808	Established the California Earthquake Education Project.
Government Code Section 8899.10-8899.16	Established the Earthquake Research Evaluation Conference.
Public Resources Code Section 2621-2630 2621.	Established the Alquist-Priolo Earthquake Fault Zoning Act.
Government Code Section 8878.50-8878.52 8878.50.	Created the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990.
Education Code Section 35295-35297 35295.	Established emergency procedure systems in kindergarten through grade 12 in all the public or private schools.
Health and Safety Code Section 19160-19169	Established standards for seismic retrofitting of unreinforced masonry buildings.
Health and Safety Code Section 1596.80-1596.879	Required all child day care facilities to include an Earthquake Preparedness Checklist as an attachment to their disaster plan.

Earthquake Education:

Earthquake research and education activities are conducted at several major universities in the Southern California region, including Cal Tech, USC, UCLA, UCSB, UCI, and UCSB. The local clearinghouse for earthquake information is the Southern California Earthquake Center located at the University of Southern California, Los Angeles, CA 90089, Telephone: (213) 740-5843, Fax: (213) 740-0011, Email: SCEinfo@usc.edu, Website: http://www.scec.org. The Southern California Earthquake Center (SCEC) is a community of scientists and specialists who actively coordinate research on earthquake hazards at nine core institutions, and communicate earthquake information to the public.

SCEC is a National Science Foundation (NSF) Science and Technology Center and is co-funded by the United States Geological Survey (USGS).

In addition, Los Angeles County along with other Southern California counties, sponsors the Emergency Survival Program (ESP), an educational program for learning how to prepare for earthquakes and other disasters. Many school districts have very active emergency preparedness programs that include earthquake drills and periodic disaster response team exercises.

Earthquake Mitigation Action Items

The Earthquake mitigation action items provide guidance on suggesting specific activities that agencies, organizations, and residents in the City of Monterey Park can undertake to reduce risk and prevent loss from earthquake events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

Short Term -Earthquake # l:

Integrate new earthquake hazard mapping data for the City of Monterey Park and improve technical analysis of earthquake hazards.

Ideas for Implementation:

- Update the City of Monterey Park earthquake HAZUS data using more localized data including the building inventory to improve accuracy of the vulnerability assessment for the City of Monterey Park.

- Conduct risk analysis incorporating HAZUS data and hazard maps using GIS technology to identify risk sites and further assist in prioritizing mitigation activities and assessing the adequacy of current land use requirements.

Coordinating Organization:	City of Monterey Park Information Technology
Timeline:	2 years
Plan Goals Addressed:	Partnerships and Implementation , Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Short Term -Earthquake # 2:

Research the Regional Earthquake Transportation Evacuation Routes into appropriate planning documents

Ideas for Implementation:

- ■ Update the transportation routes map in the City of Monterey Park Natural Hazard Mitigation Plan with the evacuation routes data.

- ■ Integrate the evacuation routes data into the City of Monterey Park Emergency Operations Plan.

Coordinating Organization:	City of Monterey Park Emergency Management
Timeline:	2 years
Plan Goals Addressed:	Emergency Services
Constraints:	Pending Funding and Available Personnel

Long Term -Earthquake # l:

Identify funding sources for structural and nonstructural retrofitting of structures that are identified as seismically vulnerable.

Ideas for Implementation:

- ■ Provide information for property owners, small businesses, and organizations on sources of funds (loans, grants, etc.).

- ■ Explore options for including seismic retrofitting in existing programs such as low-income housing, insurance reimbursements, and pre and post disaster repairs.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	Ongoing
Plan Goals Addressed:	Partnerships and Implementation , Public Awareness
Constraints:	Pending Funding and Available Personnel

Long Term -Earthquake # 2:

Encourage purchase of earthquake hazard insurance.

Ideas for Implementation:

- ■ Provide earthquake insurance information to the City of Monterey Park residents.

- ■ Coordinate with insurance companies to produce and distribute earthquake insurance information.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	Ongoing
Plan Goals Addressed:	Protect Life and Property, Public Awareness
Constraints:	Pending Funding and Available Personnel

Long Term -Earthquake # 3:

Encourage seismic strength evaluations of critical facilities in the City of Monterey Park to identify vulnerabilities for mitigation of schools, public infrastructure, and critical facilities to meet current seismic standards.

Ideas for Implementation:

- Develop an inventory of schools and critical facilities that do not meet current seismic standards.
- Encourage owners of non-retrofitted structures to upgrade them to meet seismic standards.
- Encourage water providers to replace old cast iron pipes with more ductile iron, and identify partnership opportunities with other agencies for pipe replacement.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	5 years
Plan Goals Addressed:	Protect Life and Property, Emergency Services
Constraints:	Pending funding and available personnel

Long Term -Earthquake # 4:

Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.

Ideas for Implementation:

- ■ Provide information to government building and school facility managers and teachers on securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits.

- ■ Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: “Reducing the Risks Nonstructural Earthquake Damage”.

- ■ Encourage homeowners and renters to use “Is Your Home Protected from Earthquake Disaster? A Homeowner’s Guide to Earthquake Retrofit” (IBHS) for economic and efficient mitigation techniques.

- ■ Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors.

- ■ Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	Ongoing
Plan Goals Addressed:	Protect Life and Property, Public Awareness
Constraints :	Pending Funding and Available Personnel

Earthquake Resource Directory

Local and Regional Resources

Los Angeles County Public Works Department			
Level: County	Hazard: Multi	http://ladpw.org	
900 S. Fremont Ave.			
Monterey Park, CA 91803		Ph: 626-458-5100	Fx:
Notes: The Los Angeles County Department of Public Works protects property and promotes public safety through Flood Control, Water Conservation, Road Maintenance, Bridges, Buses and Bicycle Trails, Building and Safety, Land Development, Waterworks, Sewers, Engineering, Capital Projects and Airports			
Southern California Earthquake Center (SCEC)			
Level: Regional	Hazard: Earthquake	www.scec.org	
3651 Trousdale Parkway		Suite 169	
Los Angeles, CA 90089-0742		Ph: 213-740-5843	Fx: 213/740-0011
Notes: The Southern California Earthquake Center (SCEC) gathers new information about earthquakes in Southern California, integrates this information into a comprehensive and predictive understanding of earthquake phenomena, and communicates this understanding to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives.			

State Resources

California Department of Transportation (CalTrans)			
Level: State	Hazard: Multi	http://www.dot.ca.gov/	
120 S. Spring Street			
Los Angeles, CA 90012		Ph: 213-897-3656	Fx:
Notes: CalTrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries. Alone and in partnership with Amtrak, CalTrans is also involved in the support of intercity passenger rail service in California.			
California Resources Agency			
Level: State	Hazard: Multi	http://resources.ca.gov/	
1416 Ninth Street		Suite 1311	
Sacramento, CA 95814		Ph: 916-653-5656	Fx:
Notes: The California Resources Agency restores, protects and manages the state's natural, historical and cultural resources for current and future generations using solutions based on science, collaboration and respect for all the communities and interests involved.			
California Division of Mines and Geology (DMG)			
Level: State	Hazard: Multi	www.consrv.ca.gov/cgs/index.htm	
801 K Street		MS 12-30	
Sacramento, CA 95814		Ph: 916-445-1825	Fx: 916-445-5718
Notes: The California Geological Survey develops and disseminates technical information and advice on California’s geology, geologic hazards, and mineral resources.			
California Department of Conservation: Southern California Regional Office			
Level: State	Hazard: Multi	www.consrv.ca.gov	
655 S. Hope Street		#700	

Los Angeles, CA 90017-2321	Ph: 213-239-0878	Fx: 213-239-0984

Notes: The Department of Conservation provides services and information that promote environmental health, economic vitality, informed land-use decisions and sound management of our state's natural resources.

California Planning Information Network

Level: State Hazard: Multi	www.calpin.ca.gov	
	Ph:	Fx:

Notes: The Governor's Office of Planning and Research (OPR) publishes basic information on local planning agencies, known as the California Planners' Book of Lists. This local planning information is available on-line with new search capabilities and up-to-the- minute updates.

Governor's Office of Emergency Services (OES)

Level: State Hazard: Multi	www.oes.ca.gov	
P.O. Box 419047		
Rancho Cordova, CA 95741-9047	Ph: 916 845- 8911	Fx: 916 845- 8910

Notes: The Governor's Office of Emergency Services coordinates overall state agency response to major disasters in support of local government. The office is responsible for assuring the state's readiness to respond to and recover from natural, manmade, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts.

Federal and National Resources

Building Seismic Safety Council (BSSC)			
Level: National	Hazard: Earthquake	www.bssconline.org	
1090 Vermont Ave., NW		Suite 700	
Washington, DC 20005		Ph: 202-289-7800	Fx: 202-289-109
Notes: The Building Seismic Safety Council (BSSC) develops and promotes building earthquake risk mitigation regulatory provisions for the nation.			
Federal Emergency Management Agency, Region IX			
Level: Federal	Hazard: Multi	www.fema.gov	
1111 Broadway		Suite 1200	
Oakland, CA 94607		Ph: 510-627-7100	Fx: 510-627-7112
Notes: The Federal Emergency Management Agency is tasked with responding to, planning for, recovering from and mitigating against disasters.			
Federal Emergency Management Agency, Mitigation Division			
Level: Federal	Hazard: Multi	www.fema.gov/fima/planhowto.shtm	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has a number of programs and activities which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.			
United States Geological Survey			
Level: Federal	Hazard: Multi	http://www.usgs.gov/	
345 Middlefield Road			
Menlo Park, CA 94025		Ph: 650-853-8300	Fx:

Notes: The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

Western States Seismic Policy Council (WSSPC)

Level: Regional	Hazard: Earthquake	www.wsspc.org/home.html	
125 California Avenue		Suite D201, #1	
Palo Alto, CA 94306		Ph: 650-330-1101	Fx: 650-326-1769

Notes: WSSPC is a regional earthquake consortium funded mainly by FEMA. Its website is a great resource, with information clearly categorized - from policy to engineering to education.

Institute for Business & Home Safety

Level: National	Hazard: Multi	http://www.ibhs.org/	
4775 E. Fowler Avenue			
Tampa, FL 33617		Ph: 813-286-3400	Fx: 813-286-9960

The Institute for Business & Home Safety (IBHS) is a nonprofit association that engages in communication, education, engineering and research. The Institute works to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.

Publications:

"Land Use Planning for Earthquake Hazard Mitigation: Handbook for Planners"
Wolfe, Myer R. et. al., (1986) University of Colorado, Institute of Behavioral Science, National Science Foundation.
This handbook provides techniques that planners and others can utilize to help mitigate for seismic hazards, It provides information on the effects of earthquakes, sources on risk assessment, and effects of earthquakes on the built environment. The handbook also gives examples on application and implementation of planning techniques to be used by local communities.
Contact: Natural Hazards Research and Applications Information Center
Address: University of Colorado, 482 UCB,
Boulder, CO 80309-0482
Phone: (303) 492-6818
Fax: (303) 492-2151
Website: http://www,colorado.edu/UCB/Research/IBS/hazards

"Public Assistance Debris Management Guide", FEMA (July 2000).
The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing. and controlling large-scale debris clearance, removal, and disposal operations, Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The "Public Assistance Debris Management Guide" is available in hard copy or on the FEMA website.

End Notes:

[1] http://pubs.usgs.gov/gip/earthq3/when.html

[1] http://www.gps.caltech.edu/~sieh/home.html

[1] Planning for Natural Hazards: The California Technical Resource Guide, Department of Land Conservation and Development (July 2000)

4 **http://www.data.scec.org/fault_index/newping.html**

[1] http://www.data.scec.org/fault_index/palos.html

[1] http://www.consrv.ca.gov/CGS/rghm/ap/

[1] Ibid

[1] Burby, R. (Ed.) Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities (1998), Washington D.C., Joseph Henry Press.

[1] FEMA HAZUS http://www.fema.gov/hazus/hazus2.htm (May 2001).

[1] Source: Los Angeles County Public Works Department, March 2004

[1] http://www.chamber101.com/programs_committee/natural_disasters/DisasterPreparedness/Forty.htm

[1] Institute for Business and Home Safety Resources (April 2001),

[1] http://www.seismic.ca.gov/pub/CSSC_2001-04_Hospital.pdf

SECTION 7:
- FLOOD –

Table of Contents

Why are Floods a Threat to the City of Monterey Park?

The City of Monterey Park is in the vicinity of the Los Angeles River, which is susceptible to flooding events. Flooding poses a threat to life and safety, and can cause severe damage to public and private property.

History of Flooding in the City of Monterey Park:

The City of Monterey Park is susceptible to localized flooding from severe storms and urban run-off. A much greater concern is the widespread flooding that might occur from the catastrophic failure of the Garvey Reservoir.

There are a number of rivers in the Southern California region, but the river with the best recorded history is the Los Angeles River. The flood history of the Los Angeles River is generally indicative of the flood history of much of Southern California.

Historic Flooding in Los Angeles County:

Records show that since 1811, the Los Angeles River has flooded 30 times, on average once every 6.1 years. But averages are deceiving, for the Los Angeles basin goes through periods of drought and then periods of above average rainfall. Between 1889 and 1891 the river flooded every year, and from 1941 to 1945, the river flooded 5 times. Conversely, from 1896 to 1914, a period of 18 years, and again from 1944 to 1969, a period of 25 years, the river did not have serious floods.

Flooding Incidents in Los Angeles County:

1811	Flooding
1815	Flooding
1825	L.A. River changed its course back from the Ballona wetlands to San Pedro
1832	Heavy flooding
1861-62	Heavy flooding. Fifty inches of rain falls during December and January.
1867	Floods create a large, temporary lake out to Ballona Creek.
1876	The Novician Deluge
1884	Heavy flooding causes the river to change course again, turning east to Vernon and then southward to San Pedro.
1888-1891	Annual floods
1914	Heavy flooding. Great damage to the harbor.
1921	Flooding
1927	Moderate flood
1934	Moderate flood starting January 1. Forty dead in La Canada.
1938	Great County-wide flood with 4 days of rain. Most rain on day 4.
1941-44	L.A. River floods five times.
1952	Moderate flooding
1969	One heavy flood after 9 day storm. One moderate flood.
1978	Two moderate floods
1979	Los Angeles experiences severe flooding and mudslides.
1980	Flood tops banks of river in Long Beach. Sepulveda Basin spillway almost opened.
1983	Flooding kills six people.
1992	15 year flood. Motorists trapped in Sepulveda basin. Six people dead.
1994	Heavy flooding

While the City of Monterey Park is 6 miles east of Los Angeles and has not previously experienced the type of severe, widespread flooding along the Los Angeles River and other communities, it is not so far away as to not be affected by localized storm cells and heavy rains that brought flooding to Los Angeles. In addition, the towering mountains that give the Los Angeles region its spectacular views also bring a great deal of rain out of the storm clouds passing through. Because the mountains are so steep, the rainwater moves rapidly down the slopes and across the coastal plains on its way to the ocean.

The Santa Monica, Santa Susana, and Verdugo Mountains which surround three sides of the valley seldom reach heights above three thousand feet. The western San Gabriel Mountains, in contrast, have elevations of more than seven thousand feet. These higher ridges often trap eastern moving winter storms. Although downtown Los Angeles averages just fifteen inches of rain a year, some mountain peaks in the San Gabriels receive more than forty inches of precipitation annually.

Naturally, this rainfall moves rapidly down stream, often with severe consequences for anything in its path. In extreme cases, flood-generated debris flows will roar down a canyon at speeds near 40 miles per hour with a wall of mud, debris and water tens of feet high.

In Southern California, stories of floods, debris flows, persons buried alive under tons of mud and rock and persons swept away to their death in a river flowing at thirty-five miles an hour are without end. No catalog of chaos could contain all the losses suffered by man and his possessions from the region's rivers and streams.

What Factors Create Flood Risk?

Flooding:

Occurs when climate, geology, and hydrology combine to create conditions where water flows outside of its usual course. In the City of Monterey Park, geography and climate may combine to create seasonal flooding conditions.

Winter Rainfall:

Over the last 125 years, the average annual rainfall in Los Angeles is 14.9 inches. But the term "average" means very little as the annual rainfall during this time period has ranged from only 4.35 inches in 2001-2002 to 38.2 inches in 1883-1884. In fact, in only fifteen of the past 125 years, has the annual rainfall been within plus or minus 10% of the 14.9 inch average. And in only 38 years has the annual rainfall been within plus or minus 20% of the 14.9 inch average. This makes the Los Angeles basin a land of extremes in terms of annual precipitation.

The City of Monterey Park is in the western region of the San Gabriel Valley. It is in close proximity to the San Gabriel Mountains, which increases the collection of rainwater.

Monsoons:

Another relatively regular source for heavy rainfall, particularly in the mountains and adjoining cities is from summer tropical storms. The following table lists tropical storms that have had significant rainfall in the past century, and the general areas affected by these storms. These tropical storms usually coincide with El Niño years.

Tropical Cyclones That Have Affected Southern California During the 20th Century:

Month-Year	Date(s)	Area(s) Affected	Rainfall
July 1902	20th & 21st	Deserts & Southern Mountains	up to 2"
Aug. 1906	18th & 19th	Deserts & Southern Mountains	up to 5"
Sept. 1910	15th	Mountains of Santa Barbara County	2"
Aug. 1921	20th & 21st	Deserts & Southern Mountains	up to 2"
Sept. 1921	30th	Deserts	up to 4"
Sept. 1929	18th	Southern Mountains & Deserts	up to 4"
Sept. 1932	28th - Oct 1st	Mountains & Deserts, 15 Fatalities	up to 7
Aug. 1935	25th	Southern Valleys, Mountains & Deserts	up to 2"
Sept. 1939	4th - 7th	Southern Mountains, Southern & Eastern Deserts	up to 7
	11th & 12th	Deserts, Central & Southern Mountains	up to 4"
	19th - 21st	Deserts, Central & Southern Mountains	up to 3"
	25th	Long Beach, W/ Sustained Winds of 50 Mph	5"
		Surrounding Mountains	6 to 12"
Sept. 1945	9th & 10th	Central & Southern Mountains	up to 2"
Sept. 1946	30th - Oct 1st	Southern Mountains	up to 4"
Aug. 1951	27th - 29th	Southern Mountains & Deserts	2 to 5"
Sept. 1952	19th - 21st	Central & Southern Mountains	up to 2"
July 1954	17th - 19th	Deserts & Southern Mountains	up to 2"
July 1958	28th & 29th	Deserts & Southern Mountains	up to 2"
Sept. 1960	9th & 10th	Julian	3.40"
Sept. 1963	17th - 19th	Central & Southern Mountains	up to 7"
Sept. 1967	1st - 3rd	Southern Mountains & Deserts	2"
Oct. 1972	6th	Southeast Deserts	up to 2"
Sept. 1976	10th & 11th	Central & Southern Mountains. Ocotillo, CA was Destroyed 3 Fatalities	6 to 12"
Aug. 1977	n/a	Los Angeles	2"
		Mountains	up to 8"
Oct. 1977	6th & 7th	Southern Mountains & Deserts	up to 2
Sept. 1978	5th & 6th	Mountains	3"
Sept. 1982	24th - 26th	Mountains	up to 4"
Sept. 1983	20th & 21st	Southern Mountains & Deserts	up to 3"

Geography and Geology:

The greater Los Angeles Basin is the product of rainstorms and erosion for millennia. "Most of the mountains that ring the valleys and coastal plain are deeply fractured faults and, as they (the mountains) grew taller, their brittle slopes were continually eroded. Rivers and streams carried boulders, rocks, gravel, sand, and silt down these slopes to the valleys and coastal plain. In places these sediments are as much as twenty thousand feet thick.

Much of the coastal plain rests on the ancient rock debris and sediment washed down from the mountains. This sediment can act as a sponge, absorbing vast quantities of rain in those years when heavy rains follow a dry period. But like a sponge that is near saturation, the same soil fills up rapidly when a heavy rain follows a period of relatively wet weather. So even in some years of heavy rain, flooding is minimal because the ground is relatively dry. The same amount of rain following a wet period of time can cause extensive flooding.

The greater Los Angeles basin is for all intents and purposes built out. This leaves precious little open land to absorb rainfall. The lack of open ground forces water to remain on the surface and rapidly accumulate. If it were not for the massive flood control system with its concrete lined river and stream beds, flooding would be a much more common occurrence. And the tendency is towards even less and less open land. In-fill building is becoming a much more common practice in many areas. Developers tear down an older home, which typically covers up to 40% of the lot size, and replace it with three or four town homes or apartments that may cover 90-95% of the lot.

Another potential source of flooding is "asphalt creep." The street space between the curbs of a street is a part of the flood control system. Water leaves property and accumulates in the streets, where it is directed towards the underground portion of the flood control system. The carrying capacity of the street is determined by the width of the street and the height of the curbs along the street. Often, when streets are being resurfaced, a one to two inch layer of asphalt is laid down over the existing asphalt. This added layer of asphalt subtracts from the rated capacity of the street to carry water. Thus the original engineered capacity of the entire storm drain system is marginally reduced over time. Subsequent re-paving of the street will further reduce the engineered capacity even more.

Flood Terminology

Floodplain;

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

100-Year Flood:

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

Floodway:

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

The City of Monterey Park regulations prohibit all development in the floodway. The NFIP floodway definition is "the channel of a river or other watercourse and adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot. *Floodways are not mapped for all rivers and streams but are generally mapped in developed areas.*

Flood Fringe:

The flood fringe refers to the outer portions of the floodplain, beginning at the edge of the floodway and continuing outward. In the City of Monterey Park Zoning and Development Ordinance (Zoning Ordinance), the flood fringe is generally defined as "the land area, which is outside of the stream flood way, but is subject to periodic inundation by regular flooding." This is the area where development is most likely to occur, and where precautions to protect life and property need to be taken.

Development;

For floodplain ordinance purposes, development is broadly defined by the City of Monterey Park Zoning Ordinance to mean *"any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations located within the area of special flood hazard."* The definition of development for floodplain purposes is generally broader and includes more activities than the definition of development used in other sections of local land use ordinances.

Base Flood Elevation (BFE):

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

Characteristics of Flooding:

Two types of flooding primarily affect the City of Monterey Park: riverine flooding and urban flooding (see descriptions below). In addition, any low-lying area has the potential to flood. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's capability to remove it.

Riverine Flooding:

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers.

Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Urban Flooding:

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

Almost 75 percent of the area in the City of Monterey Park has a high concentration of impermeable surfaces that either collect water, or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

Dam Failure Flooding:

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

Garvey Reservoir lies impounded behind a north dam and a south dam. MWD completed a substantial overhaul of the facility in 1999 to address seepage and ensure overall reservoir integrity. The State Department of Conservation, Division of Dam Safety conducts periodic dam inspections to verify the dams' ability to withstand seismic stresses. In the unlikely event of a conjectured catastrophic failure at Garvey Reservoir, properties to the north and south could be flooded. Failure of the north dam would create two flood zones: the first affecting the steep, undeveloped valley immediately east of the reservoir and the second flowing north, impacting properties roughly between Alhambra and New Avenues to Garvey Avenue. The estimated average flood depth is five feet.

If the south dam failed, flood waters of average depth six to seven feet would cascade down the slope bank and into the residential neighborhoods below. At the Pomona Freeway, the water would spread laterally along the north side of the freeway before flowing through freeway under-crossings.

There have been a total of 45 dam failures in California, since the 19th century. The significant dam failures in Southern California are listed below.

Dam Failures in Southern California			
Sheffield	Santa Barbara	1925	Earthquake slide
Puddingstone	Pomona	1926	Overtopping during construction
Lake Hemet	Palm Springs	1927	Overtopping
Saint Francis	San Francisquito Canyon	1928	Sudden failure at full capacity through foundation, 426 deaths
Cogswell	Monrovia	1934	Breaching of concrete cover
Baldwin Hills	Los Angeles	1963	Leak through embankment turned into washout, 3 deaths

The two most significant dam failures are the St. Francis Dam in 1928 and the Baldwin Hills Dam in 1963.

> "The failure of the St. Francis Dam, and the resulting loss of over 500 lives in the path of a roaring wall of water, was a scandal that resulted in the almost complete destruction of the reputation of its builder, William Mulholland.
>
> Mulholland was an immigrant from Ireland who rose up through the ranks of the city's water department to the position of chief engineer. It was he who proposed, designed, and supervised the construction of the Los Angeles Aqueduct, which brought water from the Owens Valley to the city. The St. Francis Dam, built in 1926, was 180 feet high and 600 feet long; it was located near Saugus in the San Francisquito Canyon.
>
> The dam gave way on March 12, 1928, three minutes before midnight. Its waters swept through the Santa Clara Valley toward the Pacific Ocean, about 54 miles away. 65 miles of valley was devastated before the water finally made its way into the ocean between Oxnard and Ventura. At its peak the wall of water was said to be 78 feet high; by the time it hit Santa Paula, 42 miles south of the dam, the water was estimated to be 25 feet deep. Almost everything in its path was destroyed: livestock, structures, railways, bridges, and orchards. By the time it was over, parts of Ventura County lay under 70 feet of mud and debris. Over 500 people were killed and damage estimates topped $20 million."
>
> The Baldwin Hills dam failed during the daylight hours, and was one of the first disaster events documented in a live helicopter broadcast.

"The Baldwin Hills Dam collapsed with the fury of a thousand cloudbursts, sending a 50-foot wall of water down Cloverdale Avenue and slamming into homes and cars on December 14, 1963.

Five people were killed. Sixty-five hillside houses were ripped apart, and 210 homes and apartments were damaged. The flood swept northward in a V-shaped path roughly bounded by La Brea Avenue and Jefferson and La Cienega boulevards.

Baldwin Hills Dam - Dark spot in upper right hand quadrant shows the beginning of the break in the dam.

The earthen dam that created a 19-acre reservoir to supply drinking water for West Los Angeles residents ruptured at 3:38 p.m. As a pencil-thin crack widened to a 75-foot gash, 292 million gallons surged out.
It took 77 minutes for the lake to empty. But it took a generation for the neighborhood below to recover. And two decades passed before the Baldwin Hills ridge top was reborn.

The cascade caused an unexpected ripple effect that is still being felt in Los Angeles and beyond. It foreshadowed the end of urban-area earthen dams as a major element of the Department of Water and Power's water storage system. It prompted a tightening of Division of Safety of Dams control over reservoirs throughout the state.

The live telecast of the collapse from a KTLA-TV helicopter is considered the precursor to airborne news coverage that is now routine everywhere.

Debris Flows:

Another flood related hazard that can affect certain parts of the Southern California region are debris flows. Most typically debris flows occur in mountain canyons and the foothills against the San Gabriel Mountains. However, any hilly or mountainous area with intense rainfall and the proper geologic conditions may experience one of these very sudden and devastating events.

> "Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast-moving landslides. These flows generally occur during periods of intense rainfall or rapid snow melt. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles per hour, but can exceed 35 miles per hour. The consistency of debris flows ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars. Debris flows from many different sources can combine in channels, and their destructive power may be greatly increased. They continue flowing down hills and through channels, growing in volume with the addition of water, sand, mud, boulders, trees, and other materials. When the flows reach flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can wreak havoc in developed areas."

Coastal Flooding:

Low lying coastal communities of Southern California have one other source of flooding, coastal flooding. This occurs most often during storms which bring higher than normal tides. Storms, the time of year and the tidal cycle can sometimes work to bring much higher than normal tides which cause flooding in low lying coastal areas. This hazard however is limited to those areas.

The Effect of Development on Floods:

When structures or fill are placed in the floodway or floodplain water is displaced. Development raises the river levels by forcing the river to compensate for the flow space obstructed by the inserted structures and/or fill. When structures or materials are added to the floodway or floodplain and no fill is removed to compensate, serious problems can arise. Flood waters may be forced away from historic floodplain areas. As a result, other existing floodplain areas may experience flood waters that rise above historic levels. Local governments must require engineer certification to ensure that proposed developments will not adversely affect the flood carrying capacity of the Special Flood Hazard Area (SFHA). Displacement of only a few inches of water can mean the difference between no structural damage occurring in a given flood event, and the inundation of many homes, businesses, and other facilities. Careful attention should be given to development that occurs within the floodway to ensure that structures are prepared to withstand base flood events.

In highly urbanized areas, increased paving can lead to an increase in volume and velocity of runoff after a rainfall event, exacerbating the potential flood hazards. Care should be taken in the development and implementation of storm water management systems to ensure that these runoff waters are dealt with effectively.

How Flood-Prone Areas Are Identified:

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The NFIP was established in 1968 as a means of providing low-cost flood insurance to the nation's flood-prone communities. The NFIP also reduces flood losses through regulations that focus on building codes and sound floodplain management. In the City of Monterey Park, the NFIP and related building code regulations went into effect *on* March 1, 1978. NFIP regulations (44 Code of Federal Regulations (CFR) Chapter 1, Section 60, 3) require that all new construction in floodplains must be elevated at or above base flood level.

The City's Community Number is 065047. The City's current effective map is designated *No Specific Flood Hazard Area (NSFHA)*. The City entered the regular phase of the National Flood Insurance Program on November 30, 1979.

Monterey Park is a map-rescinded community. This means that the community has no special flood hazard areas and a flood map for the community has not been published.

Although it may not be subject to the 100-year flood, floods of greater magnitude could occur here. In addition, certain structures may be damaged by local drainage problems. The entire community is ZONE "X" for flood insurance rating purposes

How Building Codes Address Building In Identified Flood Prone Areas:

Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) Floodplain maps are the basis for implementing floodplain regulations and for delineating flood insurance purchase requirements. A Flood Insurance Rate Map (FIRM) is the official map produced by FEMA which delineates SFHA in communities where NFIP regulations apply. FIRMs are also used by insurance agents and mortgage lenders to determine if flood insurance is required and what insurance rates should apply.

Water surface elevations are combined with topographic data to develop FIRMs. FIRMs illustrate areas that would be inundated during a 100-year flood, floodway areas, and elevations marking the 100-year-flood level. In some cases they also include base flood elevations (BFEs) and areas located within the 500-year floodplain. Flood Insurance Studies and FIRMs produced for the NFIP provide assessments of the probability of flooding at a given location. FEMA conducted many Flood Insurance Studies in the late 1970s and early 1980s. These studies and maps represent flood risk at the point in time when FEMA completed the studies. However, it is important to note that not all 100-year or 500-year floodplains have been mapped by FEMA. It is estimated that the flood maps cover none of the total population in the City of Monterey Park.

FEMA flood maps are not entirely accurate. These studies and maps represent flood risk at the point in time when FEMA completed the studies, and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities. There is currently no FEMA / FIRM map published for the City of Monterey Park as FEMA has not identified any special flood hazard areas within the City. Although the City may not be subject to the 100-year flood, floods of greater magnitude could occur and damage certain structures due to localized drainage problems.

Man-made and natural changes to the environment have changed the dynamics of storm water run-off since then.

Flood Mapping Methods and Techniques:

Although many communities rely exclusively on FIRMs to characterize the risk of flooding in their area, there are some flood-prone areas that are not mapped but remain susceptible to flooding. These areas include locations next to small creeks, local drainage areas, and areas susceptible to manmade flooding.

In order to address this lack of data, the City of Monterey Park, as well as other jurisdictions, has taken efforts to develop more localized flood hazard maps. One method that has been employed includes using highwater marks from flood events or aerial photos, in conjunction with the FEMA maps, to better reflect the true flood risk. The use of GIS (Geographic Information System) is becoming an important tool for flood hazard mapping. FIRM maps can be imported directly into GIS, which allows for GIS analysis of flood hazard areas.

Communities find it particularly useful to overlay flood hazard areas on tax assessment parcel maps. This allows a community to evaluate the flood hazard risk for a specific parcel during review of a development request. Coordination between FEMA and local planning jurisdictions is the key to making a strong connection with GIS technology for the purpose of flood hazard mapping.

FEMA and the Environmental Systems Research Institute (ESRI), a private company, have formed a partnership to provide multi-hazard maps and information to the public via the Internet. ESRI produces GIS software, including ArcViewC9 and ArcInfoC9 . The ESRI web site has information on GIS technology and downloadable maps. The hazards maps provided on the ESRI site are intended to assist communities in evaluating geographic information about natural hazards. Flood information for most communities is available on the ESRI web site. Visit www.esri.com for more information.

Hazard Assessment

Hazard Identification:

Hazard identification is the first phase of flood-hazard assessment. Identification is the process of estimating: (1) the geographic extent of the floodplain (i.e., the area at risk from flooding); (2) the intensity of the flooding that can be expected in specific areas of the floodplain; and (3) the probability of occurrence of flood events. This process usually results in the creation of a floodplain map. Floodplain maps provide detailed information that can assist jurisdictions in making policies and land-use decisions.

Vulnerability Assessment:

Vulnerability assessment is the second step of flood-hazard assessment. It combines the floodplain boundary, generated through hazard identification, with an inventory of the property within the floodplain. Understanding the population and property exposed to natural hazards will assist in reducing risk and preventing loss from future events.

Because site-specific inventory data and inundation levels given for a particular flood event (10-year, 25-year, 50-year, 100-year, 500-year) are not readily available, calculating a community's vulnerability to flood events is not straightforward. The amount of property in the floodplain, as well as the type and value of structures on those properties, should be calculated to provide a working estimate for potential flood losses.

How Flood Hazard Maps for the City of Monterey Park Were Developed:

Data Sources:

FEMA mapped the 100 -year and 500-year floodplains through the Flood Insurance Study (FIS) in conjunction with the United States Army Corps of Engineers (USACE) in August of 1987. There were previous studies done, including a Housing and Urban Development (HUD) study, which mapped the floodplain in March of 1978. The county has updated portions of the USACE and FEMA maps through smaller drainage studies in the county since that time.

Community Flood Issues:

Risk Analysis:

Risk analysis is the third and most advanced phase of a hazard assessment. It builds upon the hazard identification and vulnerability assessment. A flood risk analysis for the City of Monterey Park should include two components: (1) the life and value of property that may incur losses from a flood event (defined through the vulnerability assessment); and (2) the number and type of flood events expected to occur over time. Within the broad components of a risk analysis, it is possible to predict the severity of damage from a range of events. Flow velocity models can assist in predicting the amount of damage expected from different magnitudes of flood events.

The data used to develop these models is based on hydrological analysis of landscape features. Changes in the landscape, often associated with human development, can alter the flow velocity and the severity of damage that can be expected from a flood event.

Using GIS technology and flow velocity models, it is possible to map the damage that can be expected from flood events over time. It is also possible to pinpoint the effects of certain flood events on individual properties. At the time of publication of this plan, data was insufficient to conduct a risk analysis for flood events in the City of Monterey Park. However, the current mapping projects will result in better data that will assist in understanding risk. This plan includes recommendations for building partnerships that will support the development of a flood risk analysis in the City of Monterey Park.

What is Susceptible to Damage During a Flood Event?

The largest impact on communities from flood events is the loss of life and property. During certain years, property losses resulting from flood damage are extensive.

Development in the floodplains of the City of Monterey Park will continue to be at risk from flooding because flood damage occurs on a regular basis throughout the county. Property loss from floods strikes both private and public property. There have been no significant losses to due flooding in the City of Monterey Park over the past 25 years.

Property Loss Resulting from Flooding Events:

The type of property damage caused by flood events depends on the depth and velocity of the flood waters. Faster moving flood waters can wash buildings off their foundations and sweep cars downstream. Pipelines, bridges, and other infrastructure can be damaged when high waters combine with flood debris. Extensive damage can be caused by basement flooding and landslide damage related to soil saturation from flood events. Most flood damage is caused by water saturating materials susceptible to loss (i.e., wood, insulation, wallboard, fabric, furnishings, floor coverings, and appliances). In many cases, flood damage to homes renders them unlivable.

Manufactured Homes:

Statewide, the 1996 floods destroyed 156 housing units. Of those units, 61 % were mobile homes and trailers. Many older manufactured home parks are located in floodplain areas. Manufactured homes have a lower level of structural stability than stick-built homes, and must be anchored to provide additional structural stability during flood events. Because of confusion in the late 1980s resulting from multiple changes in NFIP regulations, there are some communities that do not actively enforce anchoring requirements. Lack of enforcement of manufactured home construction standards in floodplains can contribute to severe damages from flood events.

Business/Industry:

Flood events impact businesses by damaging property and by interrupting business. Flood events can cut off customer access to a business as well as close a business for repairs. A quick response to the needs of businesses affected by flood events can help a community maintain economic vitality in the face of flood damage. Responses to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

Public Infrastructure:

Publicly owned facilities are a key component of daily life for all citizens of the county. Damage to public water and sewer systems, transportation networks, flood control facilities, emergency facilities, and offices can hinder the ability of the government to deliver services. Government can take action to reduce risk to public infrastructure from flood events, as well as craft public policy that reduces risk to private property from flood events.

Roads:

During natural hazard events, or any type of emergency or disaster, dependable road connections are critical for providing emergency services. Road systems in the City of Monterey Park are maintained by multiple jurisdictions. Federal, state, county, and city governments all have a stake in protecting roads from flood damage. Road networks often traverse floodplain and floodway areas. Transportation agencies responsible for road maintenance are typically aware of roads at risk from flooding.

Bridges:

Bridges are key points of concern during flood events because they are important links in road networks, river crossings, and they can be obstructions in watercourses, inhibiting the flow of water during flood events. The bridges in the City of Monterey Park are state, county, city, or privately owned. A state-designated inspector must inspect all state, county, and city bridges every two years; but private bridges are not inspected, and can be very dangerous. The inspections are rigorous, looking at everything from seismic capability to erosion and scour.

Storm Water Systems:

Local drainage problems are common throughout the City of Monterey Park. There is a drainage master plan, and the City of Monterey Park Public Works staff is aware of local drainage issues. The problems are often present where storm water runoff enters culverts or goes underground into storm sewers. Inadequate maintenance can also contribute to the flood hazard in urban areas.

Water/Wastewater Treatment Facilities:

The City of Monterey Park is a part of the Sanitation Districts of Los Angeles County. The Sanitation Districts are a confederation of independent special districts serving about 5 million people in Los Angeles County. There are no wastewater treatment facilities in the City.

Water Quality:

Environmental quality problems include bacteria, toxins, and pollution.

Existing Flood Mitigation Activities:

Although there are no current flood mitigation issues at the present time, the City has taken a proactive approach to hazard mitigation and is constantly looking at any new developments or problems that may occur in the future.

The City of Monterey Park Codes:

The City of Monterey Park uses building codes, zoning codes, and various planning strategies to address the goals that aim to restrict development in areas of known hazards, and applying the appropriate safeguards.

Acquisition and Protection of Open Space in the Floodplain:

Current efforts to increase public open space in the City of Monterey Park have been paired with the need to restore and preserve natural systems that provide wildlife habitat and help to mitigate flood events. Public parks and publicly owned open spaces can provide a buffer between flood hazards and private property.

Water Districts:

All of the water districts in the City of Monterey Park are in the process of replacing old cast iron pipes with more ductile iron pipes, which will be more resilient in disaster situations. During a disaster, water districts in the region work together to provide water for the City of Monterey Park citizens. For example, the Monterey Park Water District has built inter-ties with the Metropolitan Water District for emergency situations.

Riparian Areas:

Riparian areas are important transitional areas that link water and land ecosystems. Vegetation in riparian areas is dependent on stream processes, such as flooding, and often is composed of plants that require large amounts of water, such as willows and cottonwood trees. Healthy vegetation in riparian buffers can reduce streamside erosion. During flood events, high water can cause significant erosion.

Wastewater Management:

The City of Monterey Park is a part of the Sanitation Districts of Los Angeles County. The Sanitation Districts are a confederation of independent special districts serving about 5 million people in Los Angeles County. There are no wastewater treatment facilities in the City.

Wetlands:

Many floodplain and stream-associated wetlands absorb and store storm water flows, which reduces flood velocities and stream bank erosion. Preserving these wetlands reduces flood damage and the need for expensive flood control devices such as levees. When the storms are over, many wetlands augment summer stream flows by slowly releasing the stored water back to the stream system. Wetlands are highly effective at removing nitrogen, phosphorous, heavy metals, and other pollutants from water. For this reason, artificial wetlands are often constructed for cleaning storm water runoff and for tertiary treatment (polishing) of wastewater.

Storm Water Systems:

There are a variety of surface water management providers in the county that manage water quality and storm water runoff from new development, the primary one being the Los Angeles County Department of Public Works.

Flood Management Projects:

Flood management structures can assist in regulating flood levels by adjusting water flows upstream of flood-prone areas.

Local and/or County flood control efforts, including drainage basins, pumping stations and other flood control measures.

Community Issues Summary:

The City of Monterey Park works to mitigate problems regarding flood issues when they arise. However, funding, time and manpower are often unavailable, causing the problems to go unresolved.

Flood Mitigation Action Items

The flood mitigation action items provide direction on specific activities that organizations and residents in the City of Monterey Park can undertake to reduce risk and prevent loss from flood events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

Short Term – Flood #l:

Analyze each repetitive flood property within the City of Monterey Park and identify feasible mitigation options.

Ideas for Implementation:

- Identify appropriate and feasible mitigation activities for identified repetitive flood properties. Funding may be available through FEMA' s Hazard Mitigation Grant and Flood Mitigation Assistance Programs and the Pre-disaster Mitigation Program;
- Contact repetitive loss property owners to discuss mitigation opportunities, and determine interest should future project opportunities arise; and
- Explore options for incentives to encourage property owners to engage in mitigation.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	1-2 years
Plan Goals Addressed:	Protect Life and Property, Partnerships and Implementation
Constraints:	Pending Funding and Available Personnel

Short Term – Flood #2:

Recommend revisions to requirements for development within the floodplain, where appropriate

Ideas for Implementation:

- Evaluate elevation requirements for new residential and nonresidential structures in the unincorporated floodplain area;
- Identify opportunities to upgrade Federal Insurance Rate Map, and arrange for Cooperative Technical Partnership mapping upgrades for select areas; and
- Identify alternatives to reduce development in the floodplain.

Coordinating Organization:	County Department of Transportation and Development, County Geographic Information Services, Water Environment Services
Timeline:	2 years
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Short Term – Flood #3:

Develop better flood warning systems.

Ideas for Implementation:

- Coordinate with appropriate organizations to evaluate the need for more stream gauges; and
- Distribute information regarding flooding to the general public efficiently.

Coordinating Organization:	County Emergency Management, County Public and Government Relations, Department of Transportation and Development
Timeline:	2 years
Plan Goals Addressed:	Protect Life and Property, Emergency Services
Constraints:	Pending Funding and Available Personnel

Long Term – Flood #l:

Enhance data and mapping for floodplain information within the county, and identify and map flood-prone areas outside of designated floodplains.

Ideas for Implementation:

- Apply for FEMA's cooperative technical partnership using the 2-foot contour interval floodplain mapping data acquired by the City of Monterey Park;
- Use inventory and mapping data to update the flood-loss estimates for the City of Monterey Park; and

Coordinating Organization:	County Geographic Information Services, County Department of Transportation and Development, Water Environment Services
Timeline:	3 years (as funding allows)
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Long Term – Flood #2:

Identify surface water drainage obstructions for any parts of unincorporated areas in the City of Monterey Park.

Ideas for Implementation:

- Prepare an inventory of culverts that historically create flooding problems and target them for retrofitting; and
- Prepare an inventory of major urban drainage problems, and identify causes and potential mitigation actions for urban drainage problem areas.

Coordinating Organization:	County Roads Division, Water Environment Services, County Geographic Information Systems
Timeline:	5 years
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Long Term - Flood #3:

Establish a framework to compile and coordinate surface water management plans and data throughout the county.

Ideas for Implementation:
:

- Develop surface water management plans for areas that are not currently within surface water management plan boundaries.

Coordinating Organization:	Water Environment Services, County Planning Division, Geographic Information Systems
Timeline:	5 years
Plan Goals Addressed:	Protect Life and Property, Partnerships and Implementation
Constraints:	Pending Funding and Available Personnel

Flood Resource Directory

The following resource directory lists the resources and programs that can assist county communities and organizations. The resource directory will provide contact information for local, county, regional state and federal programs that deal with natural hazards.

County Resources:

Los Angeles County Public Works Department
900 S. Fremont Ave.
Monterey Park, CA 91803
Ph: 626-458-5100

Sanitation Districts of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90607
Ph: 562-699-7411 x2301

State Resources:

Governor's Office of Emergency Services (OES)
P.O. Box 419047
Rancho Cordova, CA 95741-9047
Ph: 916 845- 8911
Fx: 916 845- 8910

California Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814
Ph: 916-653-5656

California Department of Water Resources (DWR)
1416 9th Street
Sacramento, CA 95814
Ph: 916-653-6192

California Department of Conservation: Southern California Regional Office
655 S. Hope Street, #700
Los Angeles, CA 90017-2321
Ph: 213-239-0878
Fx: 213-239-0984

Federal Resources and Programs:

Federal Emergency Management Agency (FEMA)
FEMA provides maps of flood hazard areas, various publications related to flood mitigation, funding for flood mitigation projects, and technical assistance, FEMA also operates the National Flood Insurance Program. FEMA' s mission is to reduce loss of life and property and protect the nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery.

Federal Emergency Management Agency, Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607
Ph: 510-627-7100
Fx: 510-627-7112

Federal Emergency Management Agency, Mitigation Division
500 C Street, S.W.
Washington, D.C. 20472
Ph: 202-566-1600

FEMA' s List of Flood Related Websites
This site contains a long list of flood related Internet sites from "American Heritage Rivers" to "The Weather Channel" and is a good starting point for flood information on the Internet.
Contact: Federal Emergency Management Agency, Phone: (800) 480-2520
Website: http://www.fema.gov/nfip/related.htm

National Flood Insurance Program (NFIP)
In Southern California many cities lie within flood zones as defined in FEMA Flood Maps. The City of Monterey Park is not a community within a designated flood zone. Flood insurance is available to citizens in communities that adopt and implement NFIP building standards. The standards are applied to development that occurs within a delineated floodplain, a drainage hazard area, and properties' within 250 feet of a floodplain boundary. These areas are depicted on federal Flood Insurance Rate Maps available through the county.
National Floodplain Insurance Program (NFIP)
500 C Street, S.W.
Washington, D.C. 20472
Ph: 202-566-1600

The Floodplain Management Association

The Floodplain Management website was established by the Floodplain Management Association (FMA) to serve the entire floodplain management community. It includes full-text articles, a calendar of upcoming events, a list of positions available, an index of publications available free or at nominal cost, a list of associations, a list of firms and consultants in floodplain management, an index of newsletters dealing with flood issues (with hypertext links if available), a section on the basics of floodplain management, a list of frequently asked questions (FAQs) about the Website, and a catalog of Web links.
Floodplain Management Association
P.O. Box 50891
Sparks, NV 89435-0891
Ph: 775-626-6389
Fx: 775-626-6389

The Association of State Floodplain Managers

The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning, and recovery. ASFPM fosters communication among those responsible for flood hazard activities, provides technical advice to governments and other entities about proposed actions or policies that will affect flood hazards, and encourages flood hazard research, education, and training. The ASFPM Web site includes information on how to become a member, the organization's constitution and bylaws, directories of officers and committees, a publications list, information on upcoming conferences, a history of the association, and other useful information and Internet links.
Contact: The Association of State Floodplain Managers
Address: 2809 Fish Hatchery Road, Madison, WI 53713 Phone: (608) 274-0123
Website: http://www.floods,org

National Weather Service

The National Weather Service provides flood watches, warnings, and informational statements for rivers in the City of Monterey Park.
National Weather Service
520 North Elevar Street
Oxnard, CA 93030
Ph: 805-988- 6615

Office of Hydrology, National Weather Service
The National Weather Service s Office of Hydrology (OH) and its Hydrological Information Center offer information on floods and other aquatic disasters, This site offers current and historical data including an archive of past flood summaries, information on current hydrologic conditions, water supply outlooks, an Automated Local Flood Warning Systems Handbook, Natural Disaster Survey Reports, and other scientific publications on hydrology and flooding.
National Weather Service, Office of Hydrologic Development
1325 East West Highway, SSMC2
Silver Spring, MD 20910
Ph: 301-713-1658
Fx: 301-713-0963

National Resources Conservation Service (NRCS), US Department of Agriculture
NRCS provides a suite of federal programs designed to assist state and local governments and landowners in mitigating the impacts of flood events. The Watershed Surveys and Planning Program and the Small Watershed Program provide technical and financial assistance to help participants solve natural resource and related economic problems on a watershed basis. The Wetlands Reserve Program and the Flood Risk Reduction Program provide financial incentives to landowners to put aside land that is either a wetland resource, or that experiences frequent flooding. The Emergency Watershed Protection Program (EWP) provides technical and financial assistance to clear debris from clogged waterways, restore vegetation, and stabilizing riverbanks. The measures taken under EWP must be environmentally and economically sound and generally benefit more that one property.
National Resources Conservation Service
14th and Independence Ave., SW, Room 5105-A
Washington, DC 20250
Ph: 202-720-7246
Fx: 202-720-7690

USGS Water Resources
This web page offers current US water news; extensive current (including real-time) and historical water data; numerous fact sheets and other publications; various technical resources; descriptions of ongoing water survey programs; local water information; and connections to other sources of water information.
USGS Water Resources
6000 J Street Placer Hall
Sacramento, CA 95819-6129
Ph: 916-278-3000
Fx: 916-278-3070

Bureau of Reclamation
The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. The Bureau provides leadership and technical expertise in water resources development and in the efficient use of water through initiatives including conservation, reuse, and research. It protects the public and the environment through the adequate maintenance and appropriate operation of Reclamation's facilities and manages Reclamation's facilities to fulfill water user contracts and protect and/or enhance conditions for fish, wildlife, land, and cultural resources.
Mid Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898
Ph: 916- 978-5000
Fax 916- 978-5599
http://www.usbr.gov/

Army Corps of Engineers
The Corps of Engineers administers a permit program to ensure that the nation's waterways are used in the public interest. Any person, firm, or agency planning to work in waters of the United States must first obtain a permit from the Army Corps of Engineers. The Corps is responsible for the protection and development of the nation's water resources, including navigation, flood control, energy production through hydropower management, water supply storage and recreation.
US Army Corps of Engineers
P.O. Box 532711
Los Angeles CA 90053- 2325
Ph: 213-452- 3921

Other National Resources:

American Public Works Association
2345 Grand Boulevard, Suite 500
Kansas City, MO 64108-2641
Ph: 816-472-6100
Fx: 816-472-1610

Publications:

NFlP Community Rating System Coordinator's Manual
Indianapolis, IN.
This informative brochure explains how the Community Rating System works and what the benefits are to communities. It explains in detail the CRS point system, and what activities communities can pursue to earn points. These points then add up to the "rating" for the community, and flood insurance premium discounts are calculated based upon that "rating " The brochure also provides a table on the percent discount realized for each rating (1-10). Instructions on how to apply to be a CRS community are also included.
Contact: NFIP Community Rating System
Phone: (800) 480-2520 or (317) 848-2898
Website: http://www.fema.gov/nfip/crs

Floodplain Management: A Local Floodplain Administrator's Guide to the NFlP
This document discusses floodplain processes and terminology. It contains floodplain management and mitigation strategies, as well as information on the NFIP, CRS, Community Assistance Visits, and floodplain development standards.
Contact: National Flood Insurance Program Phone: (800) 480-2520
Website: http://www.fema,gov/nfip/

Flood Hazard Mitigation Planning: A Community Guide, (June 1997).
Massachusetts Department of Environmental Management.
This informative guide offers a 10-step process for successful flood hazard mitigation. Steps include: map hazards, determine potential damage areas, take an inventory of facilities in the flood zone, determine what is or is not being done about flooding, identify gaps in protection, brainstorm alternatives and actions, determine feasible actions, coordinate with others, prioritize actions, develop strategies for implementation, and adopt and monitor the plan.
Contact: Massachusetts Flood Hazard Management Program Phone: (617) 626-1250
Website: http://www.magnetstate.ma.us/dem/programs/mitigate

Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials, (February 1987), FEMA-116.
This guidebook offers a table on actions that communities can take to reduce flood losses. It also offers a table with sources for floodplain mapping assistance for the various types of flooding hazards. There is information on various types of flood hazards with regard to existing mitigation efforts and options for action (policy and programs, mapping, regulatory, non-regulatory). Types of flooding which are covered include alluvial fan, areas behind levees, areas below unsafe dams, coastal flooding, flash floods, fluctuating lake level floods, ground failure triggered by earthquakes, ice jam flooding, and mudslides.
Contact: Federal Emergency Management Agency Phone: (800) 480-2520
Website: http://www.fema,gov

SECTION 8:
- LANDSLIDES –

Table of Contents

Why are Landslides a Threat to City of Monterey Park

Landslides are a serious geologic hazard in almost every state and many cities in America, and the City of Monterey Park is no exception. The City has experienced several episodes of slope failure during significant rainstorms and as a result of earthquakes. Nationally, landslides cause 25 to 50 deaths each year. The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually. As a seismically active region, California has had significant number of locations impacted by landslides. Some landslides result in private property damage, other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life.

Landslides can be broken down into two categories: (1) rapidly moving (generally known as debris flows), and (2) slow moving. Rapidly moving landslides or debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides are at increased risk of serious injury. Slow moving landslides can cause significant property damage, but are less likely to result in serious human injuries.

Historic Southern California Landslides:

1928 St. Francis Dam Failure:

Los Angeles County, California. The dam gave way on March 12, and its waters swept through the Santa Clara Valley toward the Pacific Ocean, about 54 miles away. Sixty five miles of valley was devastated, and over 500 people were killed. Damages were estimated at $672.1 million (in year 2000 dollars).

1956 Portuguese Bend, California:

Cost, $14.6 million (2000 dollars) California Highway 14, Palos Verdes Hills. Land use on the Palos Verdes Peninsula consists mostly of single-family homes built on large lots, many of which have panoramic ocean views. All of the houses were constructed with individual septic systems, generally consisting of septic tanks and seepage pits. Landslides have been active here for thousands of years, but recent landslide activity has been attributed in part to human activity. The Portuguese Bend landslide began its modern movement in August 1956, when displacement was noticed at its northeast margin. Movement gradually extended downslope so that the entire eastern edge of the slide mass was moving within 6 weeks. By the summer of 1957, the entire slide mass was sliding towards the sea.

1958-1971 Pacific Palisades, California:

Cost, $29.1 million (2000 dollars) California Highway 1 and house damaged.

1961 Mulholland Cut, California:

Cost, $41.5 million (2000 dollars) On Interstate 405, 11 miles north of Santa Monica, Los Angeles County.

1963 Baldwin Hills Dam Failure:

On December 14, the 650 foot long by 155 foot high earth fill dam gave way and sent 360 million gallons of water in a fifty foot high wall cascading onto the community below, killing five persons, and damaging 50 million (1963 dollars) of dollars in property.

1969 Glendora, California:

Cost, $26.9 million (2000 dollars) Los Angeles County, 175 houses damaged, mainly by debris flows.

1969 Seventh Ave., Los Angeles County, California:

Cost, $14.6 million (2000 dollars) California Highway 60.

1970 Princess Park, California:

Cost, $29.1 million (2000 dollars) California Highway 14, 10 miles north of Newhall, near Saugus, northern Los Angeles County.

1971 Upper and Lower Van Norman Dams, San Fernando, California:

Earthquake-induced landslides Cost, $302.4 million (2000 dollars). Damage due to the February 9, 1971, magnitude 7.5 San Fernando, California, earthquake. The earthquake of February 9 severely damaged the Upper and Lower Van Norman Dams.

1971 Juvenile Hall, San Fernando, California:

Landslides caused by the February 9, 1971, San Fernando, California, earthquake Cost, $266.6 million (2000 dollars). In addition to damaging the San Fernando Juvenile Hall, this 1.2 km-long slide damaged trunk lines of the Southern Pacific Railroad, San Fernando Boulevard, Interstate Highway 5, the Sylmar, California, electrical converter station, and several pipelines and canals.

1977-1980 Monterey Park, Repetto Hills, Los Angeles County, California:

Cost, $14.6 million (2000 dollars) 100 houses damaged in 1980 due to debris flows.

1978 Bluebird Canyon Orange County:

California October 2, cost, $52.7 million (2000 dollars) 60 houses destroyed or damaged. Unusually heavy rains in March of 1978 may have contributed to initiation of the landslide. Although the 1978 slide area was approximately 3.5 acres, it is suspected to be a portion of a larger, ancient landslide.

1979 Big Rock, California, Los Angeles County:
Cost, approximately $1.08 billion (2000 dollars) California Highway 1 rockslide.

1980 Southern California slides:

$1.1 billion in damage (2000 dollars) Heavy winter rainfall in 1979-90 caused damage in six Southern California counties. In 1980, the rainstorm started on February 8. A sequence of 5 days of continuous rain and 7 inches of precipitation had occurred by February 14. Slope failures were beginning to develop by February 15 and then very high-intensity rainfall occurred on February 16. As much as 8 inches of rain fell in a 6 hour period in many locations. Records and personal observations in the field on February 16 and 17 showed that the mountains and slopes literally fell apart on those 2 days.

1983 San Clemente, California, Orange County:

Cost, $65 million (2000 dollars), California Highway 1. Litigation at that time involved approximately $43.7 million (2000 dollars).

1983 Big Rock Mesa, California:

Cost, $706 million (2000 dollars) in legal claims condemnation of 13 houses, and 300 more threatened rockslide caused by rainfall

1978-1979, 1980 San Diego County, California:

Experienced major damage from storms in 1978, 1979, and 1979-80, as did neighboring areas of Los Angeles and Orange County, California. One hundred and twenty landslides were reported to have occurred in San Diego County during these 2 years. Rainfall for the rainy seasons of 78-79 and 79-80 was 14.82 and 15.61 inches (37.6 and 39.6 cm) respectively, compared to a 125-year average (1850-1975) of 9.71 inches (24.7 cm). Significant landslides occurred in the Friars Formation, a unit that was noted as slide-prone in the Seismic Safety Study for the City of San Diego. Of the nine landslides that caused damage in excess of $1 million, seven occurred in the Friars Formation, and two in the Santiago Formation in the northern part of San Diego County.

1994 Northridge, California Earthquake Landslides:

As a result of the magnitude 6.7 Northridge, California, earthquake, more than 11,000 landslides occurred over an area of 10,000 km2. Most were in the Santa Susana Mountains and in mountains north of the Santa Clara River Valley. Destroyed dozens of homes, blocked roads, and damaged oil-field infrastructure. Caused deaths from Coccidioidomycosis (valley fever) the spore of which was released from the soil and blown toward the coastal populated areas. The spore was released from the soil by the landslide activity.

March 1995 Los Angeles and Ventura Counties, Southern California:

Above normal rainfall triggered damaging debris flows, deep-seated landslides, and flooding. Several deep-seated landslides were triggered by the storms, the most notable was the La Conchita landslide, which in combination with a local debris flow, destroyed or badly damaged 11 to 12 homes in the small town of La Conchita, about 20 km west of Ventura. There also was widespread debris-flow and flood damage to homes, commercial buildings, and roads and highways in areas along the Malibu coast that had been devastated by wildfire 2 years before.

Landslide Characteristics

What is a Landslide?

"A landslide is defined as, the movement of a mass of rock, debris, or earth down a slope. Landslides are a type of "mass wasting" which denotes any down slope movement of soil and rock under the direct influence of gravity. The term "landslide" encompasses events such as rock falls, topples, slides, spreads, and flows. Landslides can be initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, disturbance and change of a slope by man-made construction activities, or any combination of these factors. Landslides can also occur underwater, causing tidal waves and damage to coastal areas. These landslides are called submarine landslides."

The size of a landslide usually depends on the geology and the initial cause of the landslide. Landslides vary greatly in their volume of rock and soil, the length, width, and depth of the area affected, frequency of occurrence, and speed of movement. Some characteristics that determine the type of landslide are slope of the hillside, moisture content, and the nature of the underlying materials. Landslides are given different names, depending on the type of failure and their composition and characteristics.

Slides move in contact with the underlying surface. These movements include rotational slides where sliding material moves along a curved surface, and translational slides where movement occurs along a flat surface. These slides are generally slow moving and can be deep. Slumps are small rotational slides that are generally shallow.

Slow-moving landslides can occur on relatively gentle slopes and can cause significant property damage, but are far less likely to result in serious injuries than rapidly moving landslides.

"Failure of a slope occurs when the force that is pulling the slope downward (gravity) exceeds the strength of the earth materials that compose the slope. They can move slowly, (millimeters per year) or can move quickly and disastrously, as is the case with debris-flows. Debris-flows can travel down a hillside of speeds up to 200 miles per hour (more commonly, 30 – 50 miles per hour), depending on the slope angle, water content, and type of earth and debris in the flow. These flows are initiated by heavy, usually sustained, periods of rainfall, but sometimes can happen as a result of short bursts of concentrated rainfall in susceptible areas. Burned areas charred by wildfires are particularly susceptible to debris flows, given certain soil characteristics and slope conditions."

What is a Debris Flow ?

A debris or mud flow is a river of rock, earth and other materials, including vegetation that is saturated with water. This high percentage of water gives the debris flow a very rapid rate of movement down a slope. Debris flows often with speeds greater than 20 mile per hour, and can often move much faster. This high rate of speed makes debris flows extremely dangerous to people and property in its path.

Landslide Events and Impacts:

Landslides are a common hazard in California. Weathering and the decomposition of geologic materials produces conditions conducive to landslides and human activity further exacerbates many landslide problems. Many landslides are difficult to mitigate, particularly in areas of large historic movement with weak underlying geologic materials. As communities continue to modify the terrain and influence natural processes, it is important to be aware of the physical properties of the underlying soils as they, along with climate, create landslide hazards. Even with proper planning, landslides will continue to threaten the safety of people, property, and infrastructure, but without proper planning, landslide hazards will be even more common and more destructive.

The increasing scarcity of build-able land, particularly in urban areas, increases the tendency to build on geologically marginal land. Additionally, hillside housing developments in Southern California are prized for the view lots that they provide.

Rock falls occur when blocks of material come loose on steep slopes. Weathering, erosion, or excavations, such as those along highways, can cause falls where the road has been cut through bedrock. They are fast moving with the materials free falling or bouncing down the slope. In falls, material is detached from a steep slope or cliff. The volume of material involved is generally small, but large boulders or blocks of rock can cause significant damage.

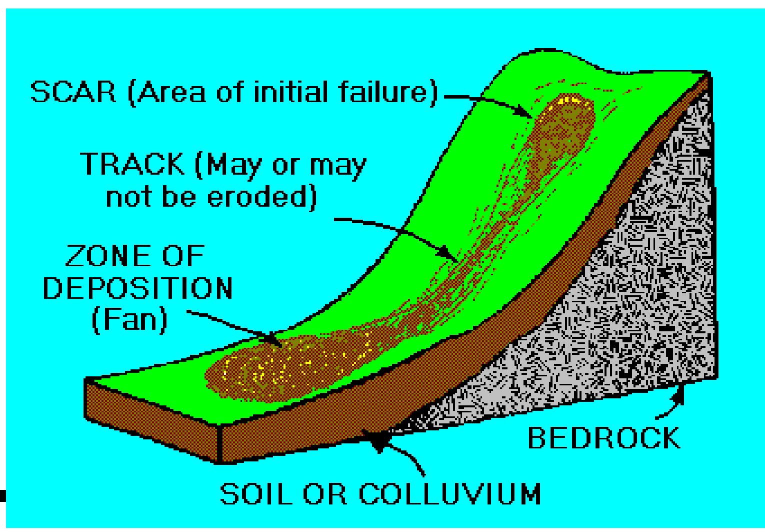
Earth flows are plastic or liquid movements in which land mass (e.g. soil and rock) breaks up and flows during movement. Earthquakes often trigger flows. Debris flows normally occur when a landslide moves downslope as a semi-fluid mass scouring, or partially scouring soils from the slope along its path. Flows are typically rapidly moving and also tend to increase in volume as they scour out the channel. Flows often occur during heavy rainfall, can occur on gentle slopes, and can move rapidly for large distances.

Landslide Conditions:

Landslides are often triggered by periods of heavy rainfall. Earthquakes, subterranean water flow and excavations may also trigger landslides. Certain geologic formations are more susceptible to landslides than others. Human activities, including locating development near steep slopes, can increase susceptibility to landslide events. Landslides on steep slopes are more dangerous because movements can be rapid.

Although landslides are a natural geologic process, the incidence of landslides and their impacts on people can be exacerbated by human activities. Grading for road construction and development can increase slope steepness. Grading and construction can decrease the stability of a hill slope by adding weight to the top of the slope, removing support at the base of the slope, and increasing water content. Other human activities effecting landslides include: excavation, drainage and groundwater alterations, and changes in vegetation.

Wildland fires in hills covered with chaparral are often a precursor to debris flows in burned out canyons. The extreme heat of a wildfire can create a soil condition in which the earth becomes impervious to water by creating a waxy-like layer just below the ground surface. Since the water cannot be absorbed into the soil, it rapidly accumulates on slopes, often gathering loose particles of soil in to a sheet of mud and debris. Debris flows can often originate miles away from unsuspecting persons, and approach them at a high rate of speed with little warning.



Natural Conditions:

Natural processes can cause landslides or re-activate historical landslide sites. The removal or undercutting of shoreline-supporting material along bodies of water by currents and waves produces countless small slides each year. Seismic tremors can trigger landslides on slopes historically known to have landslide movement. Earthquakes can also cause additional failure (lateral spreading) that can occur on gentle slopes above steep streams and riverbanks.

Particularly Hazardous Landslide Areas:

Locations at risk from landslides or debris flows include areas with one or more of the following conditions:

- ✓ On or close to steep hills;
- ✓ Steep road-cuts or excavations;
- ✓ Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground);
- ✓ Steep areas where surface runoff is channeled, such as below culverts, V -shaped valleys, canyon bottoms, and steep stream channels; and
- ✓ Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons.
- ✓ Canyon areas below hillside and mountains that have recently (within 1-6 years) been subjected to a wildland fire.

Impacts of Development:

Although landslides are a natural occurrence, human impacts can substantially affect the potential for landslide failures in the City of Monterey Park. Proper planning and geotechnical engineering can be exercised to reduce the threat of safety of people, property, and infrastructure.

Excavation and Grading:

Slope excavation is common in the development of home sites or roads on sloping terrain. Grading these slopes can result in some slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes can be at an increased risk for landslides. The added weight of fill placed on slopes can also result in an increased landslide hazard. Small landslides can be fairly common along roads, in either the road cut or the road fill. Landslides occurring below new construction sites are indicators of the potential impacts stemming from excavation.

Drainage and Groundwater Alterations:

Water flowing through or above ground is often the trigger for landslides. Any activity that increases the amount of water flowing into landslide-prone slopes can increase landslide hazards. Broken or leaking water or sewer lines can be especially problematic, as can water retention facilities that direct water onto slopes. However, even lawn irrigation in landslide prone locations can result in damaging landslides. Ineffective storm water management and excess runoff can also cause erosion and increase the risk of landslide hazards. Drainage can be affected naturally by the geology and topography of an area; Development that results in an increase in impervious surface impairs the ability of the land to absorb water and may redirect water to other areas. Channels, streams, ponding, and erosion on slopes all indicate potential slope problems.

Road and driveway drains, gutters, downspouts, and other constructed drainage facilities can concentrate and accelerate flow. Ground saturation and concentrated velocity flow are major causes of slope problems and may trigger landslides.

Changes in Vegetation:

Removing vegetation from very steep slopes can increase landslide hazards. Areas that experience wildfire and land clearing for development may have long periods of increased landslide hazard. Also, certain types of ground cover have a much greater need for constant watering to remain green. Changing away from native ground cover plants may increase the risk of landslide.

Landslide Hazard Assessment

Hazard Identification:

Identifying hazardous locations is an essential step towards implementing more informed mitigation activities. The City's foothill areas are vulnerable to slope instability. Further, most of the residential construction in the foothills of Monterey Park occurred prior to the development and enforcement of stronger grading codes in the 1970's, and before heightened awareness of slope stability issues that has resulted from the periodic intense rainstorms of the last 30 years. Consequently, there are older residences built in or near natural drainage courses and steep slopes that may be at risk from slope failures. The California Department of Conservation, Division of Mines and Geology has identified and mapped several pockets of hillside areas within the City of Monterey Park that are susceptible to seismically induced landslides (see Appendix H, Seismic Hazard Zone Map dated March 25, 1999).

Vulnerability and Risk:

Vulnerability assessment for landslides will assist in predicting how different types of property and population groups will be affected by a hazard. Data that includes specific landslide-prone and debris flow locations in the city can be used to assess the population and total value of property at risk from future landslide occurrences.

The potential for slope failure is dependent on many factors and their interrelationships. Some of the most important factors include slope height, slope steepness, sheer strength, and orientation of weak layers in the underlying geologic unity, as well as pore water pressures. Joints and shears, which weaken the rock fabric, allow penetration of water leading to deeper weathering of the rock along with increasing the pore pressures, increasing the plasticity of weak clays, and increasing the weight of the landmass. For engineering of earth materials, these factors are combined in calculations to determine if a slope meets a minimum safety standard. The generally accepted standard is a factor of safety of 1.5 or greater (where 1.0 equilibrium, and less than 1.0 is failure).

Although existing landslides are not widespread in the area, it is probable that many of the steeper hillsides do not meet the minimum factor of safety and slope stabilization may be needed if development reaches these areas.

Natural slopes, graded slopes, or graded/natural slope combinations must meet these minimum engineering standards where they impact planned homes, subdivisions, or other types of developments. Slopes adjacent to areas where the risk of economic losses from landsliding is small, such as parks and mountain roadways, are often allowed a lesser factor of safety.

While a quantitative vulnerability assessment (an assessment that describes number of lives or amount of property exposed to the hazard) has not yet been conducted for City of Monterey Park landslide events, there are many qualitative factors that point to potential vulnerability. Landslides can impact major transportation arteries, blocking residents from essential services and businesses.

Past landslide events, such as the 1980 Repetto Hills debris flow that damaged 100 homes at a cost of $14.6 million (2000 dollars) and the 1987 slope failure along Abajo Drive caused by the Whittier Earthquake, have resulted in major property damage or significantly impacted residents. During the 2004-2005 winter storms, which brought the heaviest rainfall to the City of Monterey Park in the past 100 years, over 200 public and private properties suffered slope failures totaling $6 million in damage. The slope failures ranged in severity from very minor to significant, of which 90 locations were determined to be serious enough to require approval of a geo-technical report prior to their repair. The City continues to map city landslide and debris flow areas in order to prevent future loss.

Factors included in assessing landslide risk include population and property distribution in the hazard area, the frequency of landslide or debris flow occurrences, slope steepness, soil characteristics, and precipitation intensity. This type of analysis could generate estimates of the damages to the city due to a specific landslide or debris flow event. At the time of publication of this plan, data was insufficient to conduct a risk analysis and the software needed to conduct this type of analysis was not available.

Community Landslide Issues

What is Susceptible to Landslides?

Landslides can affect utility services, transportation systems, and critical lifelines. Communities may suffer immediate damages and loss of service. Disruption of infrastructure, roads, and critical facilities may also have a long-term effect on the economy. Utilities, including potable water, wastewater, telecommunications, natural gas, and electric power are all essential to service community needs.

Loss of electricity has the most widespread impact on other utilities and on the whole community. Natural gas pipes may also be at risk of breakage from landslide movements as small as an inch or two.

Roads and Bridges:

It is not cost effective to mitigate all slides because of limited funds and the fact that some historical slides are likely to become active again even with mitigation measures. The city Roads Division alleviates problem areas by grading slides, and by installing new drainage systems on the slopes to divert water from the landslides.

This type of response activity is often the most cost-effective in the short-term, but is only temporary. Unfortunately, many property owners are unaware of slides and the dangers associated with them.

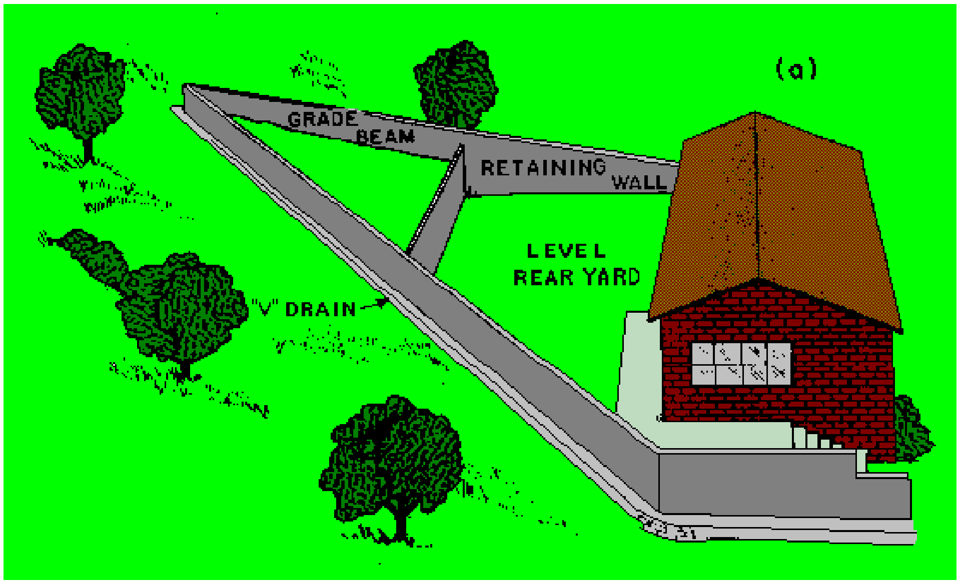
Lifelines and Critical Facilities:

Lifelines and critical facilities should remain accessible, if possible, during a natural hazard event. The impact of closed transportation arteries may be increased if the closed road or bridge is critical for hospitals and other emergency facilities. Therefore, inspection and repair of critical transportation facilities and routes is essential and should receive high priority. Losses of power and phone service are also potential consequences of landslide events.

Due to heavy rains, soil erosion in hillside areas can be accelerated, resulting in loss of soil support beneath high voltage transmission towers in hillsides and remote areas. Flood events can also cause landslides, which can have serious impacts on gas lines that are located in vulnerable soils.

Landslide Mitigation Activities:

Landslide mitigation activities include current mitigation programs and activities that are being implemented by local or city organizations.



Methods to reduce the hazard from debris avalanches include construction of a) deflection walls and b) debris fences. Because of the extreme force of impact associated with debris flows, these and similar structures should be carefully engineered and constructed. The specifics of these designs will vary from site to site.

Landslide Building/Zoning Codes

The City of Monterey Park Building Code addresses development on steep slopes. This section outlines standards for steep slope hazard areas on slopes of 20 percent or more. Generally, the ordinance requires soils and engineering geologic studies for developments proposed on slopes of 20 percent or greater. More detailed surface and subsurface investigations shall be warranted if indicated by engineering and geologic studies to sufficiently describe existing conditions. This may include soils, vegetation, geologic formations, and drainage patterns. Site evaluations may also occur where stability might be lessened by proposed grading/filling or land clearing.

Community Issues Summary:

Landslides can present a problem in the City of Monterey Park, and may impact the city's infrastructure as well as private property. The map in appendix H lists the known landslide hazard area(s), indicates if the slide(s) is active and the general boundaries.

Landslide Mitigation Action Items

The landslide mitigation action items provide direction on specific activities that the city, organizations, and residents in City of Monterey Park can undertake to reduce risk and prevent loss from landslide events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

Short Term - Landslide #l:

Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.

Ideas for Implementation:

- ✓ Conduct a landslide hazard mapping study in the City of Monterey Park.
- ✓ Develop public information to emphasize economic risk when building on potential or historical landslide areas.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	1 -2 Years
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Short Term - Landslide #2:

Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development.

Ideas for Implementation:

- ✓ Increase communication and coordination between the City's Departments.

Coordinating Organization:	Hazard Mitigation Advisory Committee
Timeline:	1 – 2 Years
Plan Goals Addressed:	Increase awareness of mitigation issues through the

	coordination of all City resources and departments.
Constraints:	Pending Funding and Available Personnel

Short Term - Landslide #3:

Identify safe evacuation routes in high-risk debris flow and landslide areas. .

Ideas for Implementation:

- ✓ Identify potential debris removal resources.
- ✓ Increase participation in regional committee planning for emergency transportation routes.
- ✓ Identify and publicize information regarding emergency transportation routes.

Coordinating Organization:	Transportation Department
Timeline:	1 – 3 Years
Plan Goals Addressed:	Protection of Life and more efficient response of emergency personnel.
Constraints:	Pending Funding and Available Personnel

Long Term - Landslide #l:

Review local ordinances regarding building and development in landslide prone areas.

Ideas for Implementation:

- ✓ Create committee of local stakeholders to study issue and make recommendations to staff.

Coordinating Organization:	Building and Safety Department
Timeline:	3 – 5 Years
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Long Term - Landslide #2:

Limit activities in identified potential and historical landslide areas through regulation and public outreach.

Ideas for Implementation:

- ✓ Analyze existing regulations regarding development in landslide prone areas.
- ✓ Identify existing mechanisms for public outreach / develop new methods of outreach.

Coordinating Organization:	Hazard Mitigation Advisory Committee, Public Information Department.
Timeline:	3 – 5 Years
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Landslide Resource Directory

County Resources:

Los Angeles County Department of Public Works
900 S. Freemont Avenue
Alhambra, CA 91803
Ph: 626-458-5100

State Resources:

California Department of Conservation: Southern California Regional Office
655 S. Hope Street, #700
Los Angeles, CA 90017-2321
Ph: 213-239-0878
Fax: 213-239-0984

California Division of Mines and Geology
801 K Street
Sacramento, CA 95814
Ph: 916-445-1825
Fax: 916-445-5718

California Division of Forestry
1416 9th Street
PO Box 944246
Sacramento, CA 94244-2460
Ph: 916-653-5123

California Department of Water Resources
1416 9th Street
Sacramento, CA 95814
Ph: 916-653-6192

Governor's Office of Emergency Services (OES)
P.O. Box 419047

Rancho Cordova, CA 95741-9047
Ph: 916-845-8911
Fax: 916-845-8910

California Department of Transportation (Cal Trans)
120 S. Spring Street
Los Angeles, CA 90012
Ph: 213-897-3656

Federal Resources and Programs:

Federal Emergency Management Agency (FEMA) – Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607
Ph: 510-627-7100
Fax: 510-627-7112

Natural Resource Conservation Service (NRCS)
PO Box 2890
Washington, DC 20013
Ph: 202-690-2621

US Geological Survey, National Landslide Information Center
345 Middlefield Road
Menlo Park, CA 94025
Ph: 650-853-8300

Publications:

Olshansky, Robert B., Planning for Hillside Development (1996) American Planning Association.
This document describes the history, purpose, and functions of hillside development and regulation and the role of planning, and provides excerpts from hillside plans, ordinances, and guidelines from communities throughout the US.

Olshansky, Robert B. & Rogers, J. David, Unstable Ground: Landslide Policy in the United States (1987) Ecology Law Quarterly.
This is about the history and policy of landslide mitigation in the US.

Public Assistance Debris Management Guide (July 2000) Federal Emergency Management Agency.
The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and city emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The Guide is available in hard copy or on the FEMA website.

USGS Landslide Program Brochure. National Landslide Information Center (NLIC), United States Geologic Survey.
The brochure provides good, general information in simple terminology on the importance of landslide studies and a list of databases, outreach, and exhibits maintained by the NLLC. The brochure also includes information on the types and causes of landslides, rock falls, and earth flows.

Landslide Endnotes:

None

SECTION 9:
- Wildfire -

Table of Contents

Why are Wildfires a Threat to Monterey Park?

For thousands of years, fires have been a natural part of the ecosystem in southern California. However, wildfires present a substantial hazard to life and property in communities built within or adjacent to hillsides and mountainous areas. There is a huge potential for losses due to wildland/urban interface fires in southern California. According to the California Division of Forestry (CDF), there were over seven thousand reportable fires in California in 2003, with over one million acres burned. According to CDF statistics, in the October, 2003 Firestorms, over 4,800 homes were destroyed and 22 lives were lost.

Due to its weather, topography, and native vegetation, the entire southern California area is at risk from wildland fires. The extended droughts characteristic of California's Mediterranean climate result in large areas of dry vegetation that provide fuel for wildland fires. Furthermore, the native vegetation typically has a high oil content that makes it highly flammable. The area is also intermittently impacted by Santa Ana winds, the hot, dry winds that blow across southern California in the spring and late fall.

A wildfire that consumes of thousands of acres of vegetated property can overwhelm local emergency response resources. Often, when a wildland fire encroaches onto the built environment, multiple ignitions develop as a result of "branding", the term for wind transport of burning cinders over a distance of a mile or more. If ignited structures sustain and transmit the fire from one building to the next, a catastrophic fire can ensure. Insurance carries consider a fire a catastrophe if it triggers at least $25 million in claims or more than 1,000 individual claims. The Oakland Hills firestorm of October 1991 was such an event. Firestorms, especially in areas of wildland-urban interfaces can be particularly dangerous and complex, posing a server threat to public and firefighter safety, and causing devastating losses of both life and property. Continuous planning, preparedness, and education are required to reduce the fire hazard potential, and to limit the destruction caused by fires.

The areas of Pasadena/Altadena lost 121 homes in the 1993 Kinneloa fire, pointing up the need for continued vigilance in the area of wildfire mitigation.

The 2003 Southern California Fires

The fall of 2003 marked the most destructive wildfire season in California history. In a ten day period, 12 separate fires raged across Southern California in Los Angeles, Riverside, San Bernardino, San Diego and Ventura counties. The massive "Cedar" fire in San Diego County alone consumed of 2,800 homes and burned over a quarter of a million acres.

Table 9-1: October 2003 Firestorm Statistics

County	Fire Name	Date Began	Acres Burned	Homes Lost	Homes Damaged	Lives Lost
Riverside	Pass	10/21/03	2,397	3	7	0
Los Angeles	Padua	10/21/03	10,446	59	0	0
San Bernardino	Grand Prix	10/21/03	69,894	136	71	0
San Diego	Roblar 2	10/21/03	8,592	0	0	0
Ventura	Piru	10/23/03	63,991	8	0	0
Los Angeles	Verdale	10/24/03	8,650	1	0	0
Ventura	Simi	10/25/03	108,204	300	11	0
San Diego	Cedar	10/25/03	273,246	2,820	63	14
San Bernardino	Old	10/25/03	91,281	1,003	7	6
San Diego	Otay / Mine	10/26/03	46,000	6	11	0
Riverside	Mountain	10/26/03	10,000	61	0	0
San Diego	Paradise	10/26/03	56,700	415	15	2
Total Losses			749,401	4,812	185	22

Source: http://www.fire.ca.gov/php/fire_er_content/downloads/2003LargeFires.pdf

Historic Fires in Southern California:

Large fires have been part of the southern California landscape for millennia. Written documents reveal that during the 19th century human settlement of southern California altered the fire regime of coastal California by increasing the fire frequency. This was an era of very limited fire suppression, and yet like today, large crown fires covering tens of thousands of acres were not uncommon. One of the largest fires in Los Angeles County (60,000 acres) occurred in 1878, and the largest fire in Orange County's history, in 1889, was over half a million acres.

Risk Assessment for Monterey Park:

Several areas have been identified as potential areas for urban interface brush fires. These areas are moderate in size ranging from several acres to dozens of acres in size. The majority of these identified areas are covered in light to moderate brush with topography ranging from gradual hillsides to very steep hillsides. The areas identified have been assessed by the fire department utilizing pre-fire planning which accounts for access, water supply, and strategic operational planning.

Previous Occurrences In Monterey Park:

The areas with the greatest likelihood of damage resulting from a wildfire are illustrated on page 9-27 in the areas marked #1, #2, #10 and #11 as identified in the map of Monterey Park. The area marked #10 burned most recently in the fall of 2007. The areas marked # 1 and 2 burned in the summer of 2002. The damage resulting from these fires was contained to vegetation only with no structural damage.

Table 9-2: Large Historic Fires in California 1961-2003

	Fire Name	Date	County	Acres	Structures	Deaths
1	Tunnel	October 1991	Alameda	1,600	2,900	25
2	Cedar	October 2003	San Diego	273,246	2,820	14
3	Old	October 2003	San Bernardino	91,281	1,003	6
4	Jones	October 1999	Shasta	26,200	954	1
5	Paint	June 1990	Santa Barbara	4,900	641	1
6	Fountain	August 1992	Shasta	63,960	636	0
7	City of Berkeley	September 1923	Alameda	130	584	0
8	Bel Air	November 1961	Los Angeles	6,090	484	0
9	Laguna Fire	October 1993	Orange	14,437	441	0
10	Paradise	October 2003	San Diego	56,700	415	2
11	Laguna	September 1970	San Diego	175,425	382	5
12	Panorama	November 1980	San Bernardino	23,600	325	4
13	Topanga	November 1993	Los Angeles	18,000	323	3
14	49er	September 1988	Nevada	33,700	312	0
15	Simi	October 2003	Ventura	108,204	300	0
16	Sycamore	July 1977	Santa Barbara	805	234	0
17	Canyon	September 1999	Shasta	2,580	230	0
18	Kannan	October 1978	Los Angeles	25,385	224	0
19	Kinneloa	October 1993	Los Angeles	5,485	196	1
19	Grand Prix	October 2003	San Bernardino	59,448	196	0
20	Old Gulch	August 1992	Calaveras	17,386	170	0

http://www.fire.ca.gov/FireEmergencyResponse/HistoricalStatistics/PDF/20LSTRUCTURES.pdf

“Structures" is meant to include all loss - homes and outbuildings, etc.

During the 2002 fire season, more than 6.9 million acres of public and private lands burned in the US, resulting in loss of property, damage to resources and disruption of community services. Taxpayers spent more than $1.6 billion to combat more than 88,400 fires nationwide. Many of these fires burned in wildland/urban interface areas and exceeded the fire suppression capabilities of those areas. Table 8-3 illustrates fire suppression costs for state, private and federal lands.

Table 9-3: National Fire Suppression Costs

Year	Suppression Costs	Acres Burned	Structures Burned
2000	$1.3 billion	8,422,237	861
2001	$0.5 billion	3,570,911	731
2002	$1.6 billion	6,937,584	815

http://research.yale.edu/gisf/assets/pdf/ppf/wildfire_report.pdf

Wildfire Characteristics:

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

Southern California has two distinct areas of risk for wildland fire. The foothills and lower mountain areas are most often covered with scrub brush or chaparral. The higher elevations of mountains also have heavily forested terrain. The lower elevations covered with chaparral create one type of exposure.

“Past fire suppression is not to blame for causing large shrubland wildfires, nor has it proven effective in halting them.” said Dr. Jon Keeley, a USGS fire researcher who studies both southern California shrublands and Sierra Nevada forests. “Under Santa Ana conditions, fires carry through all chaparral regardless of age class. Therefore, prescribed burning programs over large areas to remove old stands and maintain young growth as bands of firebreaks resistant to ignition are futile at stopping these wildfires.”

The higher elevations of Southern California’s mountains are typically heavily forested.

The magnitude of the 2003 fires is the result of three primary factors: (1) severe drought, accompanied by a series of storms that produce thousands of lightning strikes and windy conditions; (2) an infestation of bark beetles that has killed thousands of mature trees; and (3) the effects of wildfire suppression over the past century that has led to buildup of brush and small diameter trees in the forests.

When Lewis and Clark explored the Northwest, the forests were relatively open, with 20 to 25 mature trees per acre. Periodically, lightning would start fires that would clear out underbrush and small trees, renewing the forests.

Today's forests are completely different, with as many as 400 trees crowded onto each acre, along with thick undergrowth. This density of growth makes forests susceptible to disease, drought and severe wildfires. Instead of restoring forests, these wildfires destroy them and it can take decades to recover. This radical change in our forests is the result of nearly a century of well-intentioned but misguided management.

The Interface:

One challenge Southern California faces regarding the wildfire hazard is from the increasing number of houses being built on the urban/wildland interface. Every year the growing population has expanded further and further into the hills and mountains, including forest lands. The increased "interface" between urban/suburban areas and the open spaces created by this expansion has produced a significant increase in threats to life and property from fires and has pushed existing fire protection systems beyond original or current design and capability. Property owners in the interface are not aware of the problems and threats they face. Therefore, many owners have done very little to manage or offset fire hazards or risks on their own property. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Fuel:

Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is classified by volume and by type. Volume is described in terms of "fuel loading", or the amount of available vegetative fuel.

The type of fuel also influences wildfire. Chaparral is a primary fuel of Southern California wildfires. Chaparral habitat ranges in elevation from near sea level to over 5,000' in Southern California. Chaparral communities experience long dry summers and receive most of their annual precipitation from winter rains. Although chaparral is often considered as a single species, there are two distinct types; hard chaparral and soft chaparral. Within these two types are dozens of different plants, each with its own particular characteristics.

Fire has been important in the life cycle of chaparral communities for over 2 million years, however, the true nature of the "fire cycle" has been subject to interpretation. In a period of 750 years, it generally thought that fire occurs once every 65 years in coastal drainages and once every 30 to 35 years inland.

The vegetation of chaparral communities has evolved to a point it requires fire to spawn regeneration. Many species invite fire through the production of plant materials with large surface-to-volume ratios, volatile oils and through periodic die-back of vegetation. These species have further adapted to possess special reproductive mechanisms following fire. Several species produce vast quantities of seeds which lie dormant until fire triggers germination The parent plant which produces these seeds defends itself from fire by a thick layer of bark which allows enough of the plant to survive so that the plant can crown sprout following the blaze.

In general, chaparral community plants have adapted to fire through the following methods; a) fire induced flowering; b) bud production and sprouting subsequent to fire; c) in-soil seed storage and fire stimulated germination; and d) on plant seed storage and fire stimulated dispersal.

An important element in understanding the danger of wildfire is the availability of diverse fuels in the landscape, such as natural vegetation, manmade structures and combustible materials. A house surrounded by brushy growth rather than cleared space allows for greater continuity of fuel and increases the fire's ability to spread. After decades of fire suppression "dog-hair" thickets have accumulated, which enable high intensity fires to flare and spread rapidly.

Topography:

Topography influences the movement of air, thereby directing a fire course. For example, if the percentage of uphill slope doubles, the rate of spread in wildfire will likely double. Gulches and canyons can funnel air and act as chimneys, which intensify fire behavior and cause the fire to spread faster. Solar heating of dry, south-facing slopes produces up slope drafts that can complicate fire behavior. Unfortunately, hillsides with hazardous topographic characteristics are also desirable residential areas in many communities. This underscores the need for wildfire hazard mitigation and increased education and outreach to homeowners living in interface areas.

The Monterey Park area encompasses grass and brush covered hillsides that facilitate the rapid spread of fire. In some portions of the County, there is significant topographic relief. The highest point in the northwestern portion of the study area, in the Los Angeles National Forest, is nearly 1400 feet higher in elevation that the areas immediately at the base of the mountains. Traffic in urban areas, and long travel distances in rural hillside areas often hinder fire department response time.

Weather:

Weather patterns combined with certain geographic locations can create a favorable climate for wildfire activity. Areas where annual precipitation is less than 30 inches per year are extremely fire susceptible. High-risk areas in Southern California share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. The so-called "Santa Ana" winds, which are heated by compression as they flow down to Southern California from Utah, create a particularly high risk, as they can rapidly spread what might otherwise be a small fire.

The Monterey Park area typically has mild winters that lead to an annual growth of grasses and plants. This vegetation dries out during the hot summer months and is exposed to Santa Ana wind conditions in the fall. Winds in excess of 40 miles per hour are typical; gusts in excess of 100 miles per hour may occur locally. In the Monterey Park area, these winds tend to travel from north to south. However, when combined with winds generated from burning vegetation, wind direction is likely to be extremely erratic.

Drought:

Recent concerns about the effects of climate change, particularly drought, are contributing to concerns about wildfire vulnerability. The term drought is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance.

Unusually dry winters, or significantly less rainfall than normal, can lead to relatively drier conditions and leave reservoirs and water tables lower.

Drought leads to problems with irrigation and may contribute to additional fires, or additional difficulties in fighting fires.

Development:

Growth and development in scrubland and forested areas is increasing the number of human-made structures in Southern California interface areas. Wildfire has an effect on development, yet development can also influence wildfire. Owners often prefer homes that are private, have scenic views, are nestled in vegetation and use natural materials. A private setting may be far from public roads, or hidden behind a narrow, curving driveway. These conditions, however, make evacuation and fire fighting difficult. The scenic views found along mountain ridges can also mean areas of dangerous topography. Natural vegetation contributes to scenic beauty, but it may also provide a ready trail of fuel leading a fire directly to the combustible fuels of the home itself.

Wildfire Hazard Assessment:

Wildfire Hazard Identification:

Wildfire hazard areas are commonly identified in regions of the wildland/urban interface. Ranges of the wildfire hazard are further determined by the ease of fire ignition due to natural or human conditions and the difficulty of fire suppression. The wildfire hazard is also magnified by several factors related to fire suppression/control such as the surrounding fuel load, weather, topography and property characteristics. Generally, hazard identification rating systems are based on weighted factors of fuels, weather and topography.

See map in Appendix H

The table below illustrates a rating system to identify wildfire hazard risk (with a score of 3 equaling the most danger and a score of 1 equaling the least danger.)

Table 9-4: Sample Hazard Identification Rating System:

Category	Indicator	Rating
Roads and Signage	Steep; narrow; poorly signed	3
	One or two of the above	2
	Meets all requirements	1
Water Supply	None, except domestic	3
	Hydrant, tank, or pool over 500 feet away	2
	Hydrant, tank, or pool within 500 feet	1
Location of the Structure	Top of steep slope with brush/grass below	3
	Mid-slope with clearance	2
	Level with lawn, or watered groundcover	1
Exterior Construction	Combustible roofing, open eaves, Combustible siding	3
	One or two of the above	2
	Non-combustible roof, boxed eaves, non-combustible siding	1

In order to determine the "base hazard factor" of specific wildfire hazard sites and interface regions, several factors must be taken into account. Categories used to assess the base hazard factor include:

- ✓ Topographic location, characteristics and fuels;
- ✓ Site/building construction and design;
- ✓ Site/region fuel profile (landscaping);
- ✓ Defensible space;
- ✓ Accessibility;
- ✓ Fire protection response; and
- ✓ Water availability.

The use of Geographic Information System (GIS) technology in recent years has been a great asset to fire hazard assessment, allowing further integration of fuels, weather and topography data for such ends as fire behavior prediction, watershed evaluation, mitigation strategies and hazard mapping.

Vulnerability and Risk:

Southern California residents are served by a variety of local fire departments as well as county, state and federal fire resources. Data that includes the location of interface areas in the county can be used to assess the population and total value of property at risk from wildfire and direct these fire agencies in fire prevention and response.

Key factors included in assessing wildfire risk include ignition sources, building materials and design, community design, structural density, slope, vegetative fuel, fire occurrence and weather, as well as occurrences of drought.

The National Wildland/Urban Fire Protection Program has developed the Wildland/Urban Fire Hazard Assessment Methodology tool for communities to assess their risk to wildfire. For more information on wildfire hazard assessment refer to http://www.Firewise.org.

The probability that a wildfire will break out in one of the areas identified on the map of page 9-27 of Monterey Park is high. The areas with the highest probability are identified as #1, 2, 3, 4, 5, 6, 10 and 11. While weed abatement programs and brush clearing will help to reduce the spread of any wildfire, the likelihood of a brush fire resulting from a vehicle fire along either the 710 or 60 Fwy is high. The area identified by #10 and 11 contain high voltage power lines intersecting the area, therefore arcing wires could result in a brush fire. However, the likelihood of a fire starting from arcing wires would be low.

Community Wildfire Issues

What is Susceptible to Wildfire?

Growth and Development in the Interface:

The hills and mountainous areas of Southern California are considered to be interface areas. The development of homes and other structures is encroaching onto the wildlands and is expanding the wildland/urban interface. The interface neighborhoods are characterized by a diverse mixture of varying housing structures, development patterns, ornamental and natural vegetation and natural fuels.

In the event of a wildfire, vegetation, structures and other flammables can merge into unwieldy and unpredictable events. Factors important to the fighting of such fires include access, firebreaks, proximity of water sources, distance from a fire station and available firefighting personnel and equipment. Reviewing past wildland/urban interface fires shows that many structures are destroyed or damaged for one or more of the following reasons:

- ✓ Combustible roofing material;
- ✓ Wood construction;
- ✓ Structures with no defensible space;

- ✓ Fire department with poor access to structures;
- ✓ Subdivisions located in heavy natural fuel types;
- ✓ Structures located on steep slopes covered with flammable vegetation;
- ✓ Limited water supply; and
- ✓ Winds over 30 miles per hour.

What is Vulnerable in Monterey Park?

Residential and commercial vulnerability lies within each area identified on the map of Monterey Park, (Pg 9-27) should a brush fire break out. The areas identified on the map as # 1, 2 and 3 are commercial areas. Area #1 is populated by numerous Los Angeles County facilities including Los Angeles County Children's Courthouse, Cybil Brand Institute, and the Los Angeles County Sheriff's Headquarters. The areas identified by #2 and 3 are known as our Corporate Center area with numerous commercial structures. The areas identified by #4 through 11 are populated with residential structures.

Wildfire Impact on Monterey Park:

The areas identified in the map (Pg 9-27) of Monterey Park address several areas of both residential and commercial population that would have a severe economic impact in this jurisdiction. The areas identified as #4, 5, 6, 7, 8, 9, 10, and 11 are areas covered with residential structures. The economic impact of a wildfire in any one of those areas should homes be lost would be in the millions. The economic impact of a fire in the areas identified as #1, 2, and 3 would be markedly different. This area is primarily commercial. Therefore, should a fire break out in any one of these areas and cause structural damage, not only is there the physical damage in dollars but also the economic impact to the business. The numerous commercial structures in these areas would equate to tens of millions of dollars in physical damages. The impact of interruption of business would be difficult to quantify.

Road Access:

Road access is a major issue for all emergency service providers. As development encroaches into the rural areas of the county, the number of houses without adequate turn-around space is increasing. In many areas, there is not adequate space for emergency vehicle turnarounds in single-family residential neighborhoods, causing emergency workers to have difficulty doing their jobs because they cannot access houses. As fire trucks are large, firefighters are challenged by narrow roads and limited access, when there is inadequate turn around space, the fire fighters can only work to remove the occupants, but cannot safely remain to save the threatened structures.

Water Supply:

Fire fighters in remote and rural areas are faced by limited water supply and lack of hydrant taps. Rural areas are characteristically outfitted with small diameter pipe water systems, inadequate for providing sustained fire fighting flows.

Interface Fire Education Programs and Enforcement:

Fire protection in urban/wildland interface areas may rely heavily more on the landowner's personal initiative to take measures to protect his or her own property. Therefore, public education and awareness may play a greater role in interface areas. In those areas with strict fire codes, property owners who are resist maintaining the minimum brush clearances may be cited for failure to clear brush.

The Need for Mitigation Programs:

Continued development into the interface areas will have growing impacts on the wildland/urban interface. Periodically, the historical losses from wildfires in Southern California have been catastrophic, with deadly and expensive fires going back decades. The continued growth and development increases the public need for Local Hazards Mitigation Planning in Southern California.

Wildfire Mitigation Activities:

Existing mitigation activities include current mitigation programs and activities that are being implemented by county, regional, state, or federal agencies or organizations.

Local Programs:

In Southern California there are dozens of independent local fire departments as well as large county wide consolidated fire districts. Although each district or department is responsible for fire related issues in specific geographic areas, they work together to keep Southern California residents safe from fire. Although fire agencies work together to fight urban/wildland interface fires, each separate agency may have a somewhat different set of codes to enforce for mitigation activities.

The fire departments and districts provide essential public services in the communities they serve and their duties far surpass extinguishing fires. Most of the districts and departments provide other services to their jurisdictions, including Emergency Medical Services who can begin treatment and stabilize sick and injured patients in emergency situations. All of the fire service providers in the county are dedicated to fire prevention and use their resources to educate the public to reduce the threat of the fire hazard, especially in the wildland/urban interface. Fire prevention professionals throughout the county have taken the lead in providing many useful and educational services to Southern California residents, such as:

- ✓ Home fire safety inspection;
- ✓ Assistance developing home fire escape plans;
- ✓ Business Inspections;
- ✓ Monterey Park Emergency Response Training (CERT);
- ✓ Fire cause determination;
- ✓ Counseling for juvenile fire-setters;
- ✓ Teaching fire prevention in schools;

- ✓ Coordinating educational programs with other agencies, hospitals and schools; and
- ✓ Answering citizens' questions regarding fire hazards.

The Threat of Urban Conflagration:

Although communities without an urban/wildland interface are much less likely to experience a catastrophic fire, in Southern California there is a scenario where any community might be exposed to an urban conflagration similar to the fires that occurred following the 1906 San Francisco earthquake.

Large fires following an earthquake in an urban region are relatively rare phenomena, but have occasionally been of catastrophic proportions. The two largest peace-time urban fires in history, 1906 San Francisco and 1923 Tokyo, were both caused by earthquakes.

The fact that fire following earthquake has been little researched or considered in the United States is particularly surprising when one realizes that the conflagration in San Francisco after the 1906 earthquake was the single largest urban fire, and the single largest earthquake loss, in U.S. history. The loss over three days of more than 28,000 buildings within an area of 12 km^2 was staggering: $250 million in 1906 dollars, or about $5 billion at today’s prices.

The 1989 Loma Prieta Earthquake, the 1991 Oakland hills fire, and Japan’s recent Hokkaido Nansei-oki Earthquake all demonstrate the current, real possibility of a large fire, such as a fire following an earthquake, developing into a conflagration. In the United States, all the elements that would hamper fire-fighting capabilities are present: density of wooden structures, limited personnel and equipment to address multiple fires, debris blocking the access of fire-fighting equipment, and a limited water supply.

Thus in Southern California, this scenario highlights the need for fire mitigation activity in all sectors of the region, urban/wildland interface or not.

Fire Codes:

The Monterey Park Fire Department shall enforce the brush clearance requirements specified in the Uniform Fire Code (2000 Edition). The Fire Code requirements include:

- Remove all flammable vegetation or other combustible growth within 30 feet of any structure, or in areas determined to be high hazard, the brush shall be cleared a minimum of 100 feet from any structure. Single trees, ornamental shrubbery or cultivated ground covers may be permitted provided they are maintained in such a manner that they do not easily transmit fire from the vegetation to the structure.
- For areas considered extremely hazardous, the inspecting fire officer, with the approval of the Fire Chief, may require an additional 100 feet of clearance for a

total of 200 feet minimum clearance away from any structure.

- For trees taller than 18 feet, lower branches shall be pruned with a minimum clearance of 6 feet from the ground. Dead branches shall be removed or pruned from living trees. Dead branches shall not be allowed to overhang the roofs of structures or buildings.
- Woodpiles or stacked wood shall not be allowed within 30 feet of a structure. Flammable vegetation shall not be allowed within 10 feet of woodpiles or stacked wood.
- All dead leaves and flammable debris shall be removed from roofs and rain gutters.
- All chimneys and fireplaces shall be equipped with an approved metal or non-flammable spark arrestor consisting of a screen of ½ inch or smaller mesh.

It is the philosophy of the Monterey Park Fire Department to prevent catastrophic brush fires through comprehensive code enforcement efforts and, when necessary, a rapid response of properly trained and equipped firefighters. Successfully preventing fires requires a partnership between the community and the Monterey Park Fire Department to maintain the hill areas free of hazardous brush and combustible vegetation.

Federal Programs:

The role of the federal land managing agencies in the wildland /urban interface is reducing fuel hazards on the lands they administer; cooperating in prevention and education programs; providing technical and financial assistance; and developing agreements, partnerships and relationships with property owners, local protection agencies, states and other stakeholders in wildland/urban interface areas. These relationships focus on activities before a fire occurs, which render structures and communities safer and better able to survive a fire occurrence.

Federal Emergency Management Agency (FEMA) Programs FEMA is directly responsible for providing fire suppression assistance grants and, in certain cases, major disaster assistance and hazard mitigation grants in response to fires. The role of FEMA in the wildland /urban interface is to encourage comprehensive disaster preparedness plans and programs, increase the capability of state and local governments and provide for a greater understanding of FEMA programs at the federal, state and local levels.

Fire Suppression Assistance Grants:

Fire Suppression Assistance Grants may be provided to a state with an approved hazard mitigation plan for the suppression of a forest or grassland fire that threatens to become a major disaster on public or private lands. These grants are provided to protect life and improved property and encourage the development and implementation of viable multi-hazard mitigation measures and provide training to clarify FEMA's programs. The grant may include funds for equipment, supplies and personnel. A Fire Suppression Assistance Grant is the form of assistance most often provided by FEMA to a state for a fire.

The grants are cost-shared with states. FEMA’s US Fire Administration (USFA) provides public education materials addressing wildland/urban interface issues and the USFA's National Fire Academy provides training programs.

Hazard Mitigation Grant Program:

Following a major disaster declaration, the FEMA Hazard Mitigation Grant Program provides funding for long-term hazard mitigation projects and activities to reduce the possibility of damages from all future fire hazards and to reduce the costs to the nation for responding to and recovering from the disaster.

National Wildland/Urban Interface Fire Protection Program:

Federal agencies can use the National Wildland/Urban Interface Fire Protection Program to focus on wildland/urban interface fire protection issues and actions. The Western Governors' Association (WGA) can act as a catalyst to involve state agencies, as well as local and private stakeholders, with the objective of developing an implementation plan to achieve a uniform, integrated national approach to hazard and risk assessment and fire prevention and protection in the wildland/urban interface.

The program helps states develop viable and comprehensive wildland fire mitigation plans and performance-based partnerships.

U.S. Forest Service:

The U. S. Forest Service (USFS) is involved in a fuel-loading program implemented to assess fuels and reduce hazardous buildup on forest lands. The USFS is a cooperating agency and, while it has little to no jurisdiction in the lower valleys, it has an interest in preventing fires in the interface, as fires often burn up the hills and into the higher elevation US forest lands.

Other Mitigation Programs and Activities:

Some areas of the country are facing wildland/urban issues collaboratively. These are model programs that include local solutions. Summit County, Colorado, has developed a hazard and risk assessment process that mitigates hazards through zoning requirements. In California, the Los Angeles County Fire Department has retrofitted more than 100 fire engines with fire retardant foam capability and Orange County is evaluating a pilot insurance grading and rating schedule specific to the wildland/urban interface. All are examples successful programs that demonstrate the value of pre-suppression and prevention efforts when combined with property owner support to mitigate hazards within the wildland/urban interface.

Prescribed Burning:

The health and condition of a forest will determine the magnitude of wildfire. If fuels - slash, dry or dead vegetation, fallen limbs and branches - are allowed to accumulate over long periods of time without being methodically cleared, fire can move more quickly and destroy everything in its path. The results are more catastrophic than if the fuels are periodically eliminated.

Prescribed burning is the most efficient method to get rid of these fuels. In California during 2003, various fire agencies conducted over 200 prescribed fires and burned over 33,000 acres to reduce the wildland fire hazard.

Firewise:

Firewise is a program developed within the National Wildland/ Urban Interface Fire Protection Program and it is the primary federal program addressing interface fire. It is administered through the National Wildfire Coordinating Group whose extensive list of participants includes a wide range of federal agencies. The program is intended to empower planners and decision makers at the local level. Through conferences and information dissemination, Firewise increases support for interface wildfire mitigation by educating professionals and the general public about hazard evaluation and policy implementation techniques. Firewise offers online wildfire protection information and checklists, as well as listings of other publications, videos and conferences.

The interactive home page allows users to ask fire protection experts questions and to register for new information as it becomes available.

FireFree Program:

FireFree is a unique private/public program for interface wildfire mitigation involving partnerships between an insurance company and local government agencies. It is an example of an effective non-regulatory approach to hazard mitigation. Originating in Bend, Oregon, the program was developed in response to the city's "Skeleton Fire" of 1996, which burned over 17,000 acres and damaged or destroyed 30 homes and structures. Bend sought to create a new kind of public education initiative that emphasized local involvement. SAFECO Insurance Corporation was a willing collaborator in this effort. Bend's pilot program included:

1. A short video production featuring local citizens as actors, made available at local video stores, libraries and fire stations;
2. Two city-wide yard debris removal events;
3. A 3D-minute program on a model FireFree home, aired on a local cable television station; and
4. Distribution of brochures, featuring a property owner evaluation checklist and a listing of fire-resistant indigenous plants.

Wildfire Mitigation Objectives

As stated in the Federal Wildland Fire Policy, **"The problem is not one of finding new solutions to an old problem but of implementing known solutions.** Deferred decision making is as much a problem as the fires themselves. If history is to serve us in the resolution of the wildland/urban interface problem, we must take action on these issues now. To do anything less is to guarantee another review process in the aftermath of future catastrophic fires. ." Each of the following objectives will be the primary responsibility of the Monterey Park Fire Department to coordinate. While the fire department will take the primary lead on these objectives, other city resources will be called upon to assist. Those resources include, but are not limited to: Planning, GIS, Public Works, Information Systems and Building & Safety

The wildfire mitigation action items provide direction on specific activities that organizations and residents in Southern California can undertake to reduce risk and prevent loss from wildfire events. Each action item is followed by Actions, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Mitigation action items appear in their order of priority at the time of submittal of this plan. This is not to negate the option to re-prioritize as may be necessitated by environmental, economical, feasibility or policy influences may dictate. Priorities were determined by the city departments responsible for the development of mitigation actions and their implementation. Due consideration was given to the importance of each item and evaluated against the estimated costs. Furthermore, these estimated costs were evaluated against projected city revenue.

Short Term –Wildfire #l:

Enhance emergency services to increase the efficiency of wildfire response and recovery activities.

Actions:

- ✓ Install more fire reporting stations for better access and coverage;
- ✓ Develop a county call list that includes all at-risk urban /wildland interface residents in the Southern California jurisdiction in order to contact them during evacuations.

Coordinating Organization:	Monterey Park Fire Department
Timeline:	2 years
Plan Goals Addressed:	Emergency Services
Constraints:	Pending Funding and Available Personnel

Short Term –Wildfire #2:

Educate agency personnel on federal cost-share and grant programs, Fire Protection Agreements and other related federal programs so the full array of assistance available to local agencies is understood.

Actions:

- ✓ Investigate potential funding opportunities for individual mitigation projects; and
- ✓ Develop, approve and promote Fire Protection Agreements and partnerships to clarify roles and responsibilities and to provide for fire mitigation activities and suppression preparedness,

Coordinating Organization:	Monterey Park Fire Department
Timeline:	1-2 years
Plan Goals Addressed:	Protect Life and Property, Public Awareness
Constraints:	Pending Funding and Available Personnel

Short Term – Wildfire #3:

Inventory alternative firefighting water sources and encourage the development of additional sources.

Actions:

- ✓ Advocate for water storage facilities with fire-resistant electrical pump systems in developments outside of fire protection districts that are not connected to a community water or hydrant system; and
- ✓ Develop a protocol for fire jurisdictions and water districts to communicate all hydrant outages and water shortage information.

Coordinating Organization:	Monterey Park Fire, Planning and GIS Departments
Timeline:	1 year
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Long Term –Wildfire #l:

Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities and to help guide emergency services during response.

Actions:

- ✓ Update wildland/urban interface maps.
- ✓ Conduct risk analysis incorporating data and the created hazard maps using GIS technology to identify risk sites and further assist in prioritizing mitigation activities; and
- ✓ Encourage coordination between fire jurisdictions and sanitary districts to make sure that the most accurate elevation maps are being used.

Coordinating Organization:	Information Systems Department
Timeline:	1-3 years
Plan Goals Addressed:	Protect Life and Property
Constraints:	Pending Funding and Available Personnel

Long Term – Wildfire #2:

Enhance outreach and education programs aimed at mitigating wildfire hazards and reducing or preventing the exposure of citizens, public agencies, private property owners and businesses to natural hazards.

Actions:

- ✓ Encourage the hiring of fire prevention and education personnel to oversee education programs;
- ✓ Visit urban interface neighborhoods and rural areas and conduct education and outreach activities;
- ✓ Conduct specific community-based demonstration projects of fire prevention and mitigation in the urban interface;
- ✓ Establish neighborhood "drive-through" activities that pinpoint site-specific mitigation activities. Fire crews can give property owners personal suggestions and assistance; and
- ✓ Perform public outreach and information activities at fire stations by creating "Wildfire Awareness Week" activities, Fire stations can hold open houses and allow the public to visit, see the equipment and discuss wildfire mitigation with the station crews.

Coordinating Organization:	Monterey Park Fire Department

Timeline: Ongoing
Plan Goals Addressed: Protect Life and Property, Public Awareness
Constraints: Pending Funding and Available Personnel

Long Term – Wildfire #3:

Increase communication, coordination and collaboration between wildland/urban interface property owners, local and county planners and fire prevention crews and officials to address risks, existing mitigation measures and federal assistance programs.

Actions:

- ✓ Encourage single-family residences to have fire plans and practice evacuation routes;
- ✓ Encourage fire inspections in residential homes by fire departments to increase awareness among homeowners and potential fire responders;
- ✓ Encourage a standard for the State Fire Marshal to evaluate fire plans and emergency plans;
- ✓ Require fire department notification of new business applications to ensure that appropriate fire plans have been developed;
- ✓ Encourage local zoning and planning entities to work closely with landowners and/or developers who choose to build in the wildland/urban interface to identify and mitigate conditions that aggravate wildland/urban interface wildfire hazards, including:
  - Limited access for emergency equipment due to width and grade of roadways;
  - Inadequate water supplies and the spacing, consistency and species of vegetation around structures;
  - Inadequate fuel breaks, or lack of defensible space;
  - Highly flammable construction materials;
  - Building lots and subdivisions that are not in compliance with state and local land use and fire protection regulations;
  - Inadequate entry/escape routes.
  - Encourage all new homes and major remodels involving roofs additions that are located in the interface to have fire resistant roofs and residential sprinkler systems; and
  - Encourage the public to evaluate access routes to rural homes for fire-fighting vehicles and to develop passable routes if they do not exist.

Coordinating Organization: Monterey Park Fire Department with Building & Safety, Planning and Information Technology Departments
Timeline: Ongoing

Plan Goals Addressed: Protect Life and Property, Public Awareness, Emergency Services, Partnerships and Implementation
Constraints: Pending Funding and Available Personnel

Long Term – Wildfire #4:

Encourage implementation of wildfire mitigation activities in a manner consistent with the goals of promoting sustainable ecological management and community stability.

Actions:

Employ mechanical thinning and prescribed burning to abate the risk of catastrophic fire and restore the more natural regime of high frequency, low-intensity burns. Prescribed burning can provide benefit to ecosystems by thinning hazardous vegetation and restoring ecological diversity to areas homogenized by invasive plants; and Clear trimmings, trees, brush and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk.

Coordinating Organization: Monterey Park Fire Department
Timeline: Ongoing
Plan Goals Addressed: Natural Systems
Constraints: Pending Funding and Available Personnel

Wildfire Resource Directory

Local Resources:

The Monterey Park Fire Department is responsible for fire suppression on all private lands within the City of Monterey Park. The Monterey Park Fire Department constantly monitors the fire hazard in the City and has ongoing programs for investigation and alleviation of hazardous situations. Fire fighting resources in the immediate Monterey Park area include the Monterey Park Fire Department Station and response capabilities from neighboring mutual aid cities.

The Fire Department provides a full range of fire and life safety services to the residents and visitors of the City of Monterey Park. The service objectives of the fire department are currently achieved by maintaining three strategically located fire stations within the community, staffed by 62 dedicated personnel. Residents benefit from prompt response of emergency service units. The units average 4.9 minutes to any location in the city. The Fire Department provides effective fire suppression, emergency medical care, fire prevention and brush abatement, hazardous materials emergency response and inspection, fire cause investigation, and special services to the community. Firefighters are deployed twenty-four hour basis to assist residential and corporate citizens in preventing and controlling fires, treating and transporting the sick and injured, and minimizing losses when unfortunate accidents occur.

Monterey Park has mutual aid and automatic aid agreements with adjacent cities, the County of Los Angeles, and the US Forestry Service. These agreements obligate the departments to help each other under pre-defined circumstances. Automatic aid agreements obligate the nearest fire company to respond to a fire regardless of the jurisdiction. Mutual aid agreements obligate fire department resources to respond outside of their district upon request for assistance. Jurisdictions that are responsible for fire suppression in areas adjacent to Monterey Park include:

US Forest Service
Los Angles County Fire Department
City of Los Angeles
City of Montebello
City of San Gabriel
City of Alhambra

Numerous other agencies are available to assist the City if needed. Several Federal agencies have roles in fire hazard mitigation, response, and recovery, Including:

Fish and Wildlife Service
National Park Service
US Forest Service
Bureau of Land Management
Bureau of Indian Affairs
Office of Aviation Services
National Weather Service
National Association of State Foresters.
California Department of forestry

The State Office of Emergency Services can be called upon for further aid if necessary, as can Federal agencies, including:

Department of Agriculture
Department of the Interior
Department of Defense (in extreme cases)

Private companies and individuals may also assist.

County Resources:

Los Angeles County Fire Department
1320 N. Eastern Ave.
Los Angeles, CA. 90063
Telephone: 323.881.2411
http://www.lacofd.org/default.htm

State Resources:

California Division of Forestry & Fire Protection
1416 9th Street
PO Box 944246
Sacramento California 94244-2460
(916)653-5123
http://www.fire.ca.gov/php/index.php

Office of the State Fire Marshal (OSFM)
1131 "S" Street
Sacramento, CA 95814
PO Box 944246
Sacramento, CA 94244-2460
Tel. (916) 445-8200
Fax. (916) 445-8509

Federal Resources and Programs:

Federal Wildland Fire Policy, Wildland/Urban Interface Protection
This is a report describing federal policy and interface fire. Areas of needed improvement are identified and addressed through recommended goals and actions.
http://www.fs.fed.us/land/wdfire7c.htm

National Fire Protection Association (NFPA)
This is the principal federal agency involved in the National Wildland/Urban Interface Fire Protection Initiative. NFPA has information on the Initiatives programs and documents.
Public Fire Protection Division
1 Battery March Park.
P.O. Box 9101
Quincy, MA 02269-9101
Phone: (617) 770-3000

National Interagency Fire Center (NIFC)
The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations. These agencies include the Bureau of Indian Affairs, Bureau of Land Management, Forest Service, Fish and Wildlife Service, National Park Service, National Weather Service and Office of Aircraft
National Interagency Fire Center
3833 S. Development Ave.
Boise, Idaho 83705
208-387-5512
http://www.nifc,gov/

United States Fire Administration (USFA) of the Federal Emergency Management Agency (FEMA)
As an entity of the Federal Emergency Management Agency, the mission of the USFA is to reduce life and economic losses due to fire and related emergencies through leadership, advocacy, coordination and support.
USFA, Planning Branch, Mitigation Directorate
16825 S. Seton Ave.
Emmitsburg, MD 21727
(301) 447-1000
http://www.fema.gov/hazards/fires/wildfires.shtm - Wildfire Mitigation
http://www.usfa.fema.gov/index.htm - U.S. Fire Administration

Additional Resources:

Firewise - The National Wildland/Urban Interface Fire program
Firewise maintains a Website designed for people who live in wildfire prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos and conferences.
Firewise
1 Battery March Park.
P.O. Box 9101
Quincy, MA 02269-9101
Phone: (617) 770-3000
http://www.firewise.org/

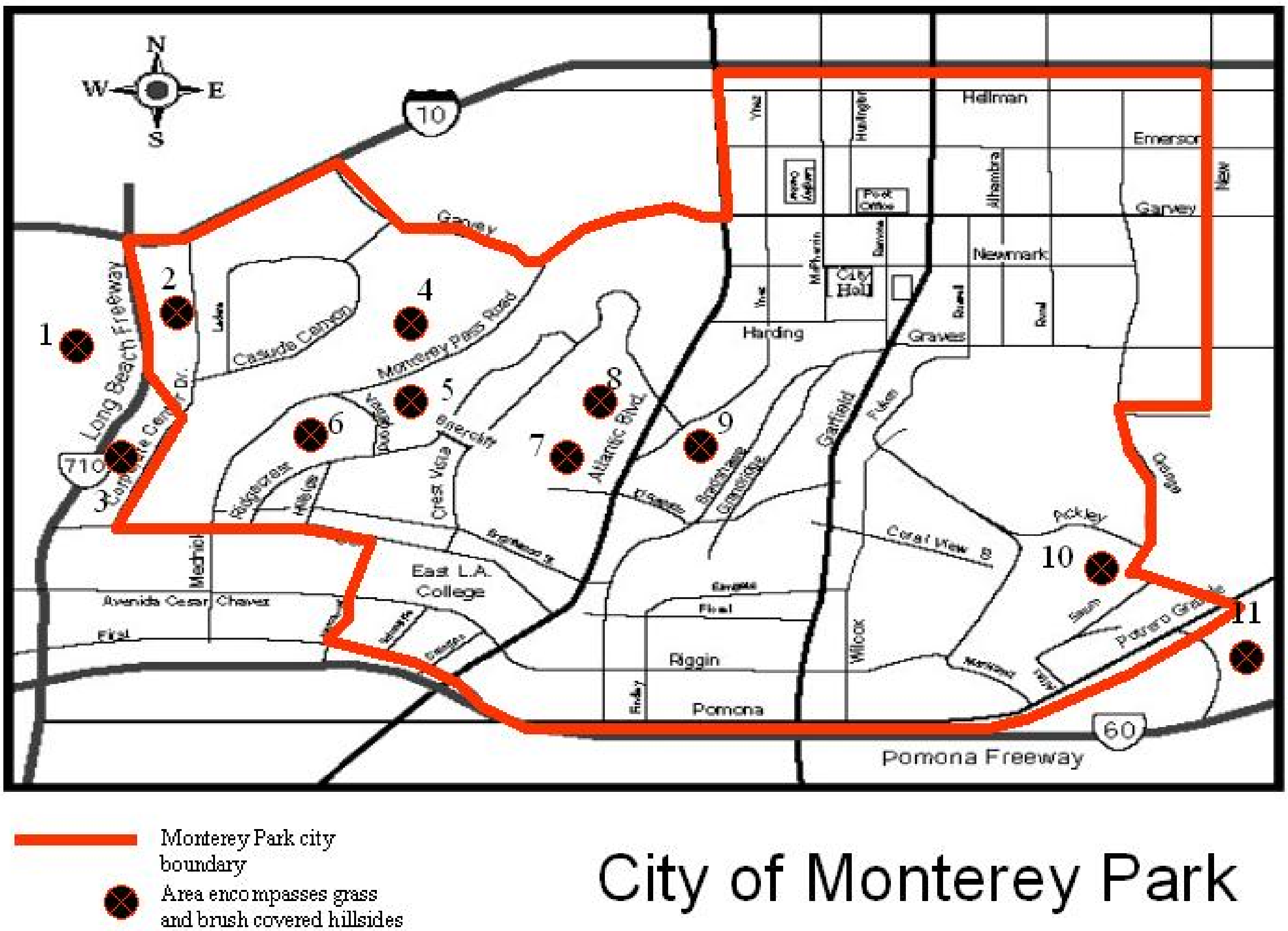
Publications:

National Fire Protection Association Standard 299: Protection of Life and Property from Wildfire, National Wildland/Urban Interface Fire Protection Program, (1991), National Fire Protection Association, Washington, D.
This document, developed by the NFPA Forest and Rural Fire Protection Committee, provides criteria for fire agencies, land use planners, architects, developers and local governments to use in the development of areas that may be threatened by wildfire. To obtain this resource:
National Fire Protection Association Publications
(800) 344-3555
http://www.nfpa.org or http://www.firewise.org

An International Collection of Wildland- Urban Interface Resource Materials (Information Report NOR- 344). Hirsch, K., Pinedo, M., & Greenlee, J. (1996). Edmonton, Alberta: Canadian Forest Service.
This is a comprehensive bibliography of interface wildfire materials. Over 2,000 resources are included, grouped under the categories of general and technical reports, newspaper articles and public education materials. The citation format allows the reader to obtain most items through a library or directly from the publisher. The bibliography is available in hard copy or diskette at no cost. It is also available in downloadable PDF form.
Canadian Forest Service, Northern Forestry Centre, I-Zone Series
Phone: (780) 435-7210
http://www.prefire.ucfpl.ucop.edu/uwibib.htm

Wildland/Urban Interface Fire Hazard Assessment Methodology.
National Wildland/Urban Interface Fire Protection Program, (1998).
NFPA, Washington, D.C.
Firewise (NFPA Public Fire Protection Division)
Phone: (617) 984-7486
http://www.firewise.org

Fire Protection in the Wildland/Urban Interface: Everyone's Responsibility.
National Wildland/Urban Interface Fire Protection Program, (1998). Washington, D.
Firewise (NFPA Public Fire Protection Division)
Phone: (617) 984-7486
http://www.firewise, org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Hellman
Emerson
Garvey
Newmark
City Hall
Post Office
Alhambra
Harding
Graves
Casuda Canyon
Monterey Pass Road
Long Beach Freeway
710
Corporate Center Dr.
Atlantic Blvd.
Crest Vista
Brightwood St.
Ridgecrest
Hillside
Garfield
Coral View
Ackley
Potrero Grande
South
East L.A. College
Avenida Cesar Chavez
First
Mednik
Riggin
Pomona
Wilcox
60
Pomona Freeway
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11
Monterey Park city boundary
Area encompasses grass and brush covered hillsides
City of Monterey Park

1 - Westbound side of 710 Fwy. Steep hillside with moderate brush. Several commercial structures are scattered along the top of this steep hillside.

2 - Eastbound side of 710 Fwy. Steep hillside covered with moderate brush and eucalyptus trees. Commercial structures line the top of this ridge.

3 - Eastbound side of 710 Fwy. Steep hillside covered with moderate brush and eucalyptus trees. Commercial structures line the top of this ridge.

4 - North side of Monterey Pass Road. Hillsides covered with light to moderate brush with residential structures at top of hillside.

5 - South side of Monterey Pass Road. Hillsides covered with light to moderate brush with residential structures at top of hillside.

6 - South side of Monterey Pass Road. Hillsides covered with light to moderate brush with residential structures at top of hillside.

7 - Residential area covered with light to moderate brush.

8 - Residential area covered with light to moderate brush.

9 - Residential area covered with light to moderate brush.

10 – Residential area covered with light to moderate brush.

11 - Refuse area covered with moderate brush with residential structures within close proximity.

TABLE OF CONTENTS