City of Beverly Hills
Hazard Mitigation Plan

Working Draft
OCTOBER 14, 2004

Date Adopted:

HAZARD MITIGATION ACTION PLAN

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Note: The information on some of the maps noted in this plan was derived from City of Beverly Hills's ***iTeam Locational Sciences*. Care was taken in the creation of these maps, but is provided "as is ". The City of Beverly Hills cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these maps. Although information from land surveys may have been used in the creation of these maps, in no way does this product represent a land survey. Users are cautioned to field verify information on this product before making any decisions

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EXECUTIVE SUMMARY

FIVE-YEAR ACTION PLAN MATRIX
Changes to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides the basis for federal assistance to state and local governments impacted by a disaster, have placed a new emphasis on local mitigation planning. Hazard Mitigation, also known as prevention before the occurrence of a disaster, is now considered to be the first step in preparing for emergencies, rather than the final step in recovery. The Disaster Mitigation Act 2000 requires state and local governments to develop hazard mitigation plans by November 2004. On March 2, 2004 the City Council approved the development of such a plan. The plan is now completed and on October 19, 2004 the City Council adopted the resolution approving the Hazard Mitigation Action Plan.

The City of Beverly Hills Hazard Mitigation Action Plan includes resources and information to assist City departments, residents, public and private sector organizations, and others interested in participating in planning for hazards. The mitigation plan provides a list of activities that may assist City of Beverly Hills in reducing risk and preventing loss from future hazard events. The strategies address multi- hazard issues, as well as activities for earthquakes, wildfires, terrorism, earth movements, flooding, and wind storms. This plan meets the requirements of the Disaster Mitigation Act of 2000. By preparing this plan, the City of Beverly Hills is eligible for federal mitigation funding after disasters and to apply for mitigation grants before disasters strike.

HOW IS THE PLAN ORGANIZED
Each section of the mitigation plan provides information and resources to assist people in understanding the City and the hazard related issues facing departments, 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 hazard events.

The mitigation plan is organized as follows:

EXECUTIVE SUMMARY: FIVE-YEAR ACTION PLAN
The Five-Year Action Plan provides an overview of the mitigation plan mission, goals, and strategies.

PART I: MITIGATION ACTION PLAN
Section 1: Introduction
The Introduction describes the background and purpose of developing the mitigation plan and the planning process.
Section 2: Community Profile
This section presents the history, geography, demographics, and socioeconomics of City of Beverly Hills.
Section 3: Risk Assessment
This section provides information on hazard identification, vulnerability and risk associated with hazards in City of Beverly Hills.

Section 4: Multi-Hazard Goals and Strategies
This section provides information on the plan goals and strategies that address the six hazards identified.
Section 5: Plan Maintenance
This section provides information on plan implementation, monitoring and evaluation.

PART II: HAZARD SPECIFIC INFORMATION
Hazard specific information on the six most likely hazards is addressed in the plan. Each of these sections provides information on the background and history of the hazard, hazard causes and characteristics, a risk assessment as well as the economic and social impacts of the hazard. Various City data and maps are used to provide background and context for the narrative.

Hazards addressed in the plan are as follows:
Section 6: Earthquake
Section 7: Fire
Section 8: Terrorism
Section 9: Flooding
Section 10: Earth Movement (Landslide)
Section 11: Windstorm

PART III: RESOURCES
Resources include, but are not limited to, all information used to gather information to assemble the entire Hazard Mitigation Plan.

WHO PARTICIPATED IN DEVELOPING THE PLAN
The development of the plan has been a collaborative staff and community effort. The planning process has been facilitated by the City's Office of Emergency Management with participation from all City departments. The Steering Committee was comprised of the Fire Chief, the Police Chief, Director's of the Office of Emergency Management, Community Development, Community Services, Administrative Services, Information Technology, Public Works, Transportation and Engineering and the City Attorney's Office. The public was invited to participate in the development of the plan.

The Steering Committee was chosen to create the form and substance of the plan as well as to provide imperative feedback, guidance and approval. This Steering Committee drafted the Mission Statement, Plan Goals, identified the hazards list, and developed and approved the plan and strategies. Project Coordinators were appointed by each City Department Head. Each Project Coordinator was assigned to write a section of the plan and to collaborate with the Steering Committee and other Project Coordinators on the final work product.

WHAT IS THE PLAN MISSION
The City of Beverly Hills Hazard Mitigation Plan is to promote sound public policy and programs designed to protect the public, critical facilities, infrastructure, private and public property and the environment from natural and manmade hazards. This will be achieved by developing and

implementing this plan to guide the City towards creating and maintaining a safer more sustainable community.

WHAT ARE THE PLAN GOALS

The plan goals describe the overall direction that City of Beverly Hills' departments and citizens can take to minimize the impacts of hazards. The Plan goals help to guide direction of future activities aimed at reducing risk and preventing loss from hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations that are outlined in the strategies.

PLAN GOALS

To Protect Life, Property, Environment

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to hazards.

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

Encourage preventative measures for existing and new development in areas vulnerable to hazards.

Public Awareness

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

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

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

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.

Assist in the development of the Safety Element of the General Plan

Emergency Management

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

Update current ordinances, make recommendations for City guidelines, codes, and permitting process and establish new ordinances that support mitigation.

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

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

HOW ARE THE STRATEGIES ORGANIZED

The strategies are a listing of activities in which City departments and citizens can be engaged to reduce risk. Each strategy includes an estimate of the time line for implementation. The strategies are organized within a detailed matrix, which lists all of the multi-hazard and hazard-specific strategies included in the mitigation plan. Departments developed these strategies based on department goals, data collection, research and the public participation process. The following overview chart

HAZARD	**The hazard the strategy mitigates.**
PROJECT NAME	**Name of the Mitigation project strategy.**
DESCRIPTION	**Strategy Description**
ACTION ITEM	**What actions will be completed to complete the strategy.**
COORDINATING DEPARTMENT	**The department with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. The main department responsible is in bold, the supporting departments are not.**
IDEAS FOR IMPLEMENTATION	**Each project includes ideas for implementation and potential resources, which may include grant programs or human resources.**
TIMELINE/COMPLETION DATE	**Each project includes an estimate of the time line for implementation.**
TOTAL COST	**Estimate of cost of project.**
FUNDING SOURCE(S)	**Where the funding will be obtained.**
CONSTRAINTS	**Constraints may apply to some of the action projects. These constraints maybe 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**

PLAN GOALS ADDRESSED **The plan goals addressed by each project are included as away to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins**.			
	Public Awareness		Protect Life and Property
	Partnerships and Implementation		Emergency Management

Chart 7. MITIGATIONS STRATEGIES OVERVIEW CHART

Lead departments denoted in **BOLD**

Hazard	Mitigation Strategy	Responsible Department	Timeline	Plan Goals Addressed			
				To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Earthquake	**1. Earthquake Mitigation** Evaluate Mel Green Report	Community Development	2007	X	X	X	X
Earthquake	**2 Seismic Modifications for Water System Reservoirs and Pump Stations** Improve seismic deficiencies by retrofitting piping, valves, tanks, and pump stations	Public Works	2005	X			X
Earthquake	**3. Operations Service Center Building Mitigation**	Public Works	2006	X			
Earthquake	**4. Update the Safety Element of the General Plan** Update the Safety Element of the General Plan	Planning	2006	X			X
Fire	**5. FireWise Program** To create a sustainable balance that will allow communities to live safely while maintaining environmental harmony in a wildland/urban interface setting by implementation of Firewise Program.	**Public Works**, Engineering & Trans., Fire	2006	X	X	X	X
Fire	**6. Wildland Interface Task Force** Establish a Wildland Interface Task force to implement Firewise programs.	Fire	2006	**X**	X	X	X
Fire	**7. Code Update** Review and update existing city codes to reflect recommendations set forth by the FireWise assessment and Joint Wildland Interface Task Force.	**Community Development**, **Fire**	2006	**X**	X	X	X
Fire	**8. Zone 9 (Closed water Pressure Zone) Hillside Fire Protection** To increase water pressure and access to water in case of an emergency. The project will increase water supply reliability and capacity in Zone 9 for conflagrations in the vicinity of Coldwater Canyon and areas contiguous to the City and the City of Los Angeles' Franklin Canyon Reservoir.	Fire	2005	X		X	X
Terrorism	**9. Police Officer Training** Train and equip all police officers to operational level	Police	2005	X			X
Terrorism	**10. First Responder** Train and equip all first responders and field personnel to awareness level	**Police,** Office of Emergency Management (OEM), All Departments	2005	X			X
Terrorism	**11. Risk Assessment** Assist City staff with critical facilities assessment	**Police**, OEM	2006	X			X

Hazard	Mitigation Strategy	Responsible Department	Timeline	Plan Goals Addressed			
Terrorism	**12. Target Hardening** Upgrade city facilities to improve security	**Police,** OEM, Community Development, Engineering & Trans., Project Administration	2006	X			X
Terrorism	**13. Terrorism Liaison** Participate in Terrorism Early Warning Group	**Police, Fire**	2004	X			
Terrorism	**14. Cyber-Terrorism Prevention -** Upgrade Information Technology Security infrastructure and upgrade disaster recovery	Information Technology	2007	X		X	X
Terrorism	**15. Terrorism Public Awareness** Provide community outreach and education to individuals and businesses concerning actions they can take in preparation for possible terrorist events.	**Police**, OEM, Community Relations	2006			X	X
Flood	**16. Storm Drain System Improvements** Locate facilities throughout the city that will facilitate mitigation deficiencies defined in the Storm Drain System Master Plan.	**Public Works** , Engineering & Trans.	2009	X	X		X
Flood	**17. Flood Ordinance Revision** Update the Flood Ordinance	**Engineering & Transportation** Community Development/ Building & Safety	2008		X		X
Landslide	**18. Geotechnical Investigation** Conduct additional geotechnical investigation to update the landslide hazard maps in the City of Beverly Hills to improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.	**Engineering& Transportation,** Community Development	2007	X			
Landslide	**19. Hillside Development Construction** Encourage application of designs and construction technologies for steep slopes to reduce the potential adverse impacts from development	**Engineering and Transportation,** Community Development	On going			X	
Landslide	**20. Public Outreach of Landslide** provide information to educate residents to prevent landside on hillside slopes.	**Engineering & Transportation,** OEM**,** Communication Department, Public Works	2005		X		

Hazard	Mitigation Strategy	Responsible Department	Timeline	Plan Goals Addressed			
Windstorm	**21. Public Awareness Campaign** Provide public education materials to City of Beverly Hills 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.	**Recreation & Parks**, Communications and Marketing, OEM	On going 2006	X	X	X	
Windstorm	**22. Tree pruning and Fire Code Sections** Create local City and utility awareness of tree pruning and Fire Code Sections relevant to wind-resistant utility operations.	**Fire**, Community Development, Public Works, OEM, Recreation & Parks, Engineering & Trans.	2009			X	
Windstorm	**23. Equipment Testing** Encourage Critical City Facilities to purchase and/or test backup power facilities for use during a power failure.	Public Works	Ongoing			X	
Multi-Hazard	**24. Conservation Classroom** To educate the community about water conservation so water resources are available as demands increase and/or supply decreases	Public Works	2007		X	X	
Multi-Hazard	**25. Emergency Alert System Upgrade** To purchase, install and integrate additional equipment to make the necessary upgrades to the system so that the cable TV warning system will have the capability to notify all cable television subscribers with in the City.	Information Technology	2008	X	X		X
Multi-Hazard	**26. Business Community Awareness Program** Provide education on Hazard Mitigation and preparedness to business community.	**OEM**, Communication & Marketing	2007	X	X		
Multi-Hazard	**27. Citizen Corp** Expand the City's citizen Corps Program	**OEM**, Fire, Police	2006		X	X	X
Multi-Hazard	**28. Emergency Evacuation Routes** Identify safe evacuation routes in high-risk debris flow and landslide areas.	**Police**, Fire, Engineering & Transportation **,** Public Works, OEM	2005	X			X
Multi-Hazard	**29. Alley Clearance**	**Public Works**, Recreation & Parks	On going	X	X	X	X

HOW WILL THE PLAN BE IMPLEMENTED, MONITERED, EVALUATED
The Plan Maintenance section of this document details the formal process that will ensure that the City of Beverly Hills Hazard 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 Beverly Hills government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City's General Plan, Capital Improvement Plans, and Building & Safety Codes.

PLAN ADOPTION
The City Council adopts the City of Beverly Hills Hazard Mitigation Plan. Once the plan has been adopted, the City's Director of Emergency Management will be responsible for submitting it to the State Hazard Mitigation Officer at the Governor's Office of Emergency Management. The Governor's Office of Emergency Management 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 Beverly Hills will gain eligibility for Hazard Mitigation Grant Program funds.

Plan implementation and evaluation will be a shared responsibility among all of the Hazard Mitigation Steering Committee Members. According to federal requirements, the Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect program changes. Copies of the plan will be made available to all interested parties.

The approved Hazard Mitigation Plan will be significant in the future growth and development of the community. The Beverly Hills Hazards Mitigation Plan was approved by the City Council on October 19, 2004. The City Council Resolution adopting the plan is set forth as Appendix G.

COORDINATING BODY
A City of Beverly Hills Hazard Mitigation Steering Committee was responsible for coordinating implementation of plan strategies and undertaking the formal review process.

CONVENER
The City Council will adopt the City of Beverly Hills Hazard Mitigation Plan, and the Hazard Mitigation Steering Committee will take responsibility for plan implementation. The Director of the Office of Emergency Management will serve as a convener to facilitate the Hazard Mitigation Steering 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 Hazard Mitigation Steering Committee Members.

IMPLEMENTATION THROUGH EXISTING PROGRAMS
The City of Beverly Hills addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and City Building & Safety Codes. The 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 Beverly Hills will have the opportunity to implement recommended mitigation strategies through existing programs and procedures.

FINANCIAL ANALYSIS

For each mitigation strategy listed in the plan, careful consideration was given to the reasonable costs of implementation. A Cost Benefit chart can be found in the plan which addresses the feasibility of implementation of each strategy developed. Costs related to the program will be tracked through the program budget.

FORMAL REVIEW PROCESS

The City of Beverly Hills Hazard Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and timeline, and identifies the departments and organizations participating in plan evaluation. The convener will be responsible for contacting the Hazard Mitigation Steering 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 Beverly Hills 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 Public Library. The existence and location of these copies will be available on the City's website and through bulletins. 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. The City website contains an email address and phone number to which the public can direct their comments and concerns.

SECTION 1
INTRODUCTION

The City of Beverly Hills is a 5.7 square mile municipality surrounded by the cities of Los Angeles and West Hollywood. It was incorporated in 1914. Approximately 33,784 people now live in Beverly Hills and the city's daytime population has been estimated as low as 110,000 and as high as 250,000. As a General Law City, the City is governed by five City Council members elected for overlapping terms. The City employs over 600 full time and approximately 300 part time employees. Departments and Offices include: City Manger's Office, Community Development, City Clerk, City Attorney, Communications & Marketing, Government and Human Relations, Economic Development, Office of Emergency Management, Fire Department, Administrative Services, Information Technology, Police Department, Public Works, Community Services, Department of Transportation and Engineering. The City of Beverly Hills Police and Fire Departments maintain a response time of less than three minutes and under four minutes, respectively. High standards for training and state of the art equipment have resulted in a incidence of crime that is lower than that in any surrounding agency. Moreover, Beverly Hills is acknowledged as one of the seven most fire-safe cities in the country. **(**See map 1**)**

The City of Beverly Hills' appeal also results from its lush garden-like setting created by its many municipal parks, botanical gardens, and tree lined streets. To maintain this distinctive Urban environment, the City tends more than 30,000 park and street trees and budgets seven times the national, city average. The homeowners also pride themselves in the rich and lush landscaping.

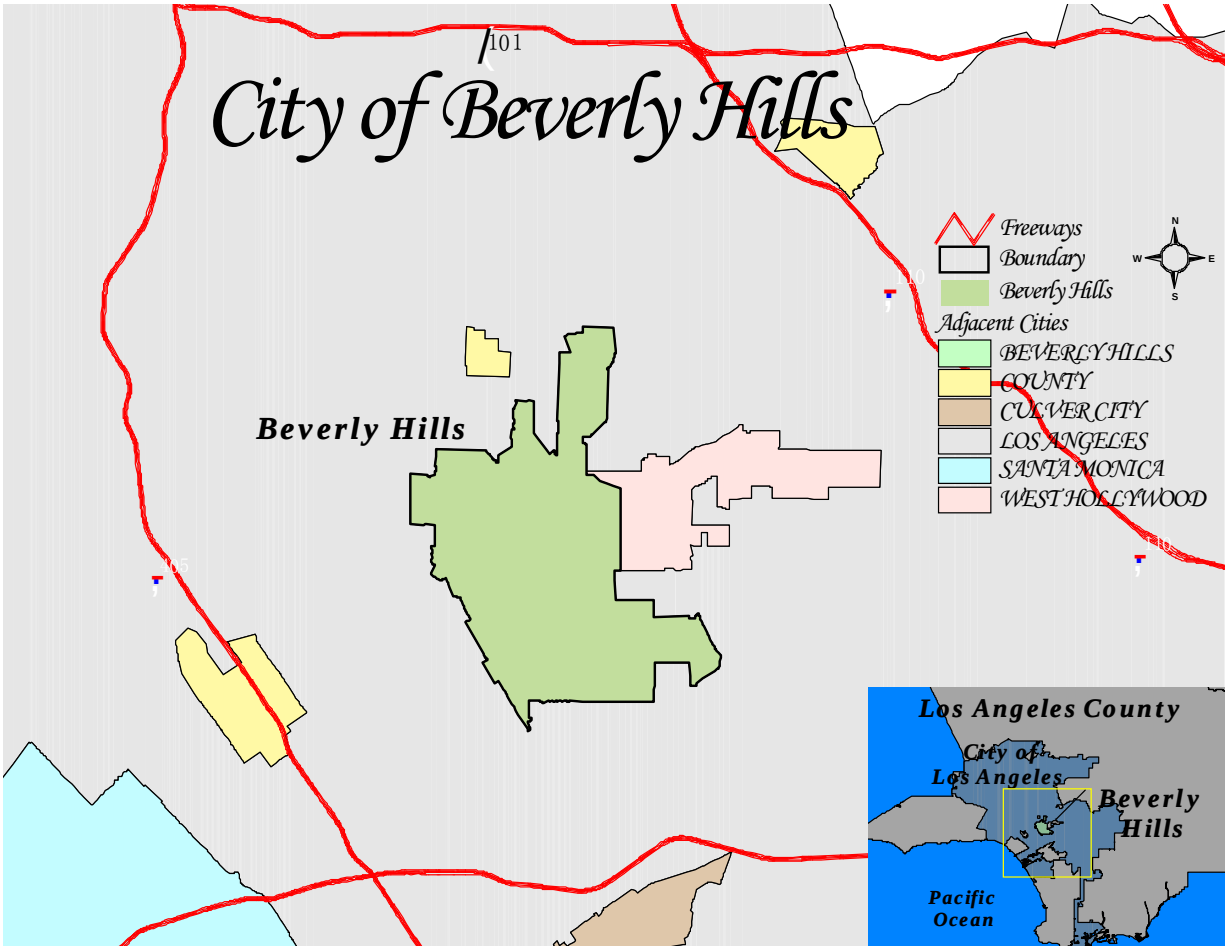
Although Beverly Hills has a diverse population, its popular image is that of homes to the rich and famous. Today Beverly Hills is an important retail, financial, and professional center. Property value within the City's radius exceeds $8.1 billion, and real estate is priced accordingly. The Business Triangle attracts many commercial businesses. The rent along Rodeo Drive can be as high as $264 per square foot annually ($22.00 per square foot per month). Prices for a single residence in Beverly Hills could average $2.5 million and range from three bedrooms to 40+ room mansions.

With its celebrity residents, international boutiques, luxury hotels, and acclaimed restaurants, Beverly Hills has become the most popular destination for Southern California visitors.
The following threat assessments identify and summarize the hazards that could impact the City of Beverly Hills:

- An earthquake would impact the total population.
- The City has little industry and therefore is not affected by stationary hazardous materials users.
- The southeast portion of the City may be subject to flooding, due to flash flooding and urban flooding (storm drain failure/infrastructure breakdown).
- The City is not vulnerable to storm surge inundation associated with hurricanes and tropical storms.
- The entire Los Angeles basin is considered as a risk area for a nuclear event or act of terrorism; therefore both sheltering and evacuation should be considered.

- The City is at high risk at its interface for Urban Wildfire.
- The region above Sunset Blvd. has been declared a High Fire Hazard zone.

Map 1: City of Beverly Hills



Emergencies and disasters can cause damage to the City of Beverly Hills its residents, businesses, infrastructure and our environment. These disasters can cost tremendous amounts of money in terms of response and recovery dollars, economic and can cause death or injuries. As the population of the City continues to increase, the exposure to hazards creates an even higher risk than previously experienced.

Throughout its history, the residents of City of Beverly Hills have dealt with the various hazards affecting the area. State, County and local history shows that the residents of the area have dealt or

will deal with earthquakes, earth movements including landslide and mudslide, flooding, fires (including wildland and structural),wind storms and terrorism.

While the City cannot prevent disasters from happening, their effects can be reduced or eliminated through a well organized public education and awareness effort, preparedness and mitigation. Most hazards cannot be fully mitigated; therefore the community must be prepared to provide efficient and effective response and recovery.

The City of Beverly Hills is the 51st most populous of the eighty-eight cities in Los Angeles County **(1)**. The City is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of hazards associated with the terrain make the environment and population vulnerable to natural disaster situations.

Chart 1 reflects disasters occurring in Los Angeles County within the last fifteen years. Chart 2 shows disasters within the City of Beverly Hills within last fifteen years.

Chart 1 - Los Angeles County Disasters since 1989

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Economic	Mediterranean Fruit Fly	N/A	1989	Los Angeles	8/9/1989	Not declared			
Fire	Santa Barbara Fires	DR-872	1990	Los Angeles, Santa Barbara, Riverside, San Bernardino	6/28/90, 6/29/90	6/30/1990	3	89	$300,000,000
Earthquake	Upland Earthquake	N/A	1990	Los Angeles, San Bernardino	3/9/90, 3/13/90	Not declared	0	38	$12,034,150
Economic	Mexican Fruit Fly	N/A	1990	Los Angeles, San Diego	5/14/1990	Not declared			
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	2/25/1992	5		$123,240,531
Civil Unrest	Los Angeles Civil Disorder	DR-942	1992	Los Angeles	4/29/1992	5/22/1992	53	2,383	$800,000,000
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	1/15/1993	20	10	$600,000,000
Fire	Southern California Firestorms	DR-1005	1993	Los Angeles, Ventura, San Diego, Orange, Riverside, San Bernardino	10/27/93, 10/28/93	10/28/1993	4	162	$1,000,000,000
Earthquake	Northridge Earthquake	DR-1008	1994	Los Angeles, Ventura, Orange	1/17/94, 1/24/94	1/17/1994	57	11,846	$40,000,000,000
Severe Storm, Flood	Late Winter Storms	DR-1046	1995	All counties except Del Norte		1/10/1995	17		$1,100,000,000

Hazard Type	Disaster Name	Disaster #	Year	Counties and Cities Declared	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
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	1/13/1995	11		$741,400,000
Fire	Southern California Firestorms	EM-3120	1996	Los Angeles, Orange, San Diego	10/1/1996			5	$40,000,000
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 Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Siskiyou, Solano, Sonoma, Stanislaus, Sutter, Tehama, Trinity, Tulare, Ventura, Yolo, Yuba			17		$550,000,000
Earthquake	Sierra Madre Earthquake	N/A	2003	Los Angeles	7/5/1991	Not declared	1	30	$33,500,000
Fire	Southern California Wildfires	DR-1498	2003	Ventura, Los Angeles, San Bernardino, Riverside, San Diego	10/24-26/03	10/27/2003			

Chart 2: City of Beverly Hills Disasters since 1989

Hazard Type	Disaster Name	Disaster #	Year	Federal Declaration	Cost of Damage to the City
Civil Unrest	Los Angeles Civil Disorder	DR-942	1992	5/22/1992	$166,380
Flood	1992 Late Winter Storms	DR-979	1992	1/15/1993	$267,390
Earthquake	Northridge Earthquake	DR-1008	1994	1/17/1994	1,439,219.00
Severe Storm	Severe Winter Storms	DR-1044	1995	1/13/1995	$11,198

***Private Property Loss Amount: Unknown**

WHY DEVELOP A MTIGATION PLAN?

Changes to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides the basis for federal assistance to state and local governments impacted by a disaster, have placed a new emphasis on local mitigation planning. Hazard Mitigation, also known as prevention before the occurrence of a disaster, is now considered to be the first step in preparing for emergencies, rather than the final step in recovery. FEMA is now requiring state and local governments to develop hazard mitigation plans by November 2004. The consequences of not having an approved Local Hazard Mitigation Plan are significant. Without one, the City would be ineligible for FEMA mitigation programs include the Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, and most importantly, potential loss of public assistance funding for repetitively damaged facilities following a disaster. Based on past disasters, the City of Beverly Hills has or will receive over nine hundred thousand in past hazard mitigation money and over two and a half million dollars in public assistance funding. This funding is not in jeopardy but demonstrates the importance of completing the plan.

Some of the required contents of a Local Hazard Mitigation Plan exist in current City planning documents. The General Plan, existing building codes, the Mountain Fire District Mitigation Plan, the Storm Water Master Plan, the Master Plan and the Multi-Hazard Disaster Plan contain requirements of the Local Hazard Mitigation Plan. Departments along with respective project coordinators reviewed existing documentation. (Note the Resource Directory for further documentation) Also writing this plan will assist in the writing of the Seismic Safety Element of the General Plan.

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

This plan assists the City 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. Upon completion, the Local Hazard Mitigation Plan will include mitigation strategies that outline the City's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to

expand on and improve these existing tools. This plan will formalize all mitigation and associated data completed in the past and create a direction for mitigation in the future.

The resources and information within the Mitigation Plan:

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

WHOM DOES THE MITIGATON PLAN AFFECT?

The City of Beverly Hills Hazard Mitigation Plan affects the entire city. This plan provides a framework for planning for hazards. The resources and background information in the plan is applicable City-wide, and the goals and recommendations can lay groundwork for mitigation plans and partnerships.

PLANNING PROCESS

The development of the plan was a collaborative city and community effort. It was coordinated by the Office of Emergency Management with participation from all City departments. A Steering Committee was established, composed of the Fire Chief, Police Chief, Director's of the Office of Emergency Management, Community Development, Community Services, Administrative Services, Information Technology, Public Works, Transportation and Engineering and the City Attorney's Office. The Steering Committee was chosen to facilitate the progression of the plan, provide imperative feedback, guidance and approval. This Steering Committee wrote the Mission Statement, Plan Goals, decided and approved the hazards, and will approve the plan and strategies. Project Coordinators were appointed by the Department Head and a Project Coordinator Committee was established. Each Project Coordinator was assigned to write a section of the plan. Each of the plan sections provides information on the history, economic and social impact of a specific hazard. The sections provide current mitigation measures instituted previously by the City of Beverly Hills and cites various sources as to where to obtain more information on each hazard. Various data and maps are used.

Information in the Mitigation Plan is based on research from a variety of sources. Staff from the City of Beverly Hills conducted data research and analysis, facilitated steering committee meetings and public workshops, and developed the final mitigation plan.

INPUT FROM THE STEERING COMMITTEE

The Hazard Mitigation Steering Committee convened about every four weeks over the course of seven months to guide development of the Mitigation Plan. The committee played an integral role in developing the mission, goals, and strategies for the mitigation plan. The Steering Committee was comprised of the following representatives:

Mahdi Aluzri
Director of Community Development
Community Development Department

Rob Beste
Public Works Director
Public Works

Pete Bonano
Fire Chief
Beverly Hills Fire Department

David Gustavson
Director of Transportation and Planning
Transportation & Engineering

Julie Kahn
Community Process Coordinator
Community Relations

Steve Miller
Director of Recreation and Parks
Recreation and Parks

Pamela Mottice-Muller
Director of Emergency Management
Office of Emergency Management

Maria Rychlicki
Director of Community Relations
Community Relations

David Snowden
Chief of Police
Beverly Hills Police Department

Roderick Wood
City Manager

Roxanne Diaz
Assistant City Attorney
City Attorney's Office

Don Oblander
Chief Financial Officer
Administrative Services

Keone Kali
Director of Information Technology
Information Technology

Project Coordinators were chosen by the Steering Committee to assemble each Hazard's section within the overall plan.

Project Coordinators and Hazards

Vincent Chee - Landslide
Project Civil Engineer
Transportation & Engineering

Donna Jerex - Community Profile
Senior Planner
Community Development Department/Planning

Sam Lee - Earthquake
Plan Review Manager
Community Development Department / Bldg & Safety

Ken Pfalzgrag - Windstorm
Urban Forest Supervisor
Recreation and Parks

Maria Rychlicki - Community Process
Director of Community Relations
Community Relations

Steve Vance - Fire
Administrative Fire Captain
Beverly Hills Fire Department

Robert Cavaglieri - Fire
Deputy Fire Chief
Beverly Hills Fire Department

Ed Otsuka - Flood
Utilities Service Manager
Public Works

Lt. Joseph Lombardi - Terrorism
Police Lieutenant
Police Department

As shown in Appendix E, the Hazard Mitigation Steering Committee and various other stakeholders met regularly for more than ten months to develop the plan. This process involved much dialogue, discussion and input on the development of the plan.

RESOURCES/OUTSIDE INPUT
City of Beverly Hills staff examined multiple existing mitigation plans from around the country, current FEMA hazard mitigation planning standards (31`86 series) and the State of California Hazard Mitigation Plan Guidance.

HAZARD SPECIFIC RESEARCH
City of Beverly Hills staff collected data and compiled research on hazards. Research materials came from a variety of sources. The City of Beverly Hills staff conducted research using data and speaking with experts, current mitigation activities, resources and programs, and potential strategies from research materials and stakeholder input.

Project Coordinators assembled their sections of the plan referencing various sources including, but not limited to:

Federal Emergency Management Agency
State Office of Emergency Services
Los Angeles County Office of Emergency Management
City of Beverly Hills School District
Los Angeles County Fire Department
Los Angeles County Public Works
Edison International
City of Beverly Hills Chamber of Commerce
Firewise Program
United States Census
City of Beverly Hills Records
Los Angeles County Records
City of Beverly Hills General Plan

STATE AND FEDERAL GUIDELINES AND REQUIREMENTS FOR MITIGATION PLANS

The following are the Federal requirements for approval of a Hazard Mitigation Plan:

- Open public involvement, with public meetings that introduce the process and project requirements.
- 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 & 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.
- Plan Review by both State OES and FEMA

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

PUBLIC/COMMUNITY PROCESS

Public participation is a key component of strategic planning processes. Citizen participation offers the residential and business community the opportunity for inclusion of their interests and concerns into the process. The Federal Emergency Management Agency requires public input during the development of local hazard mitigation plans. The public was invited to participate in the development of the plan. Information was provided on the City's website, AM radio station, cable and in the City newspaper.

The City of Beverly Hills' Natural Hazards Mitigation Plan integrates a cross section of local resident and business community input. To accomplish meaningful participation, rather than appointing, educating and grappling with scheduling concerns of a project-specific steering committee, it was deemed more efficient and more representatives to enlist the expertise of existing city commissions, homeowner groups and business interest's representative of all stakeholders in the community. Targeted groups have been provided presentations on the purpose behind and development of the City's Hazards Mitigation Plan. Information provided from these groups has been considered in the planning process of the plan. At project milestones, these groups were presented updates to ensure that there was public support for the plan strategies.

This has been a collaborative effort with input from all departments and the community. The City is working with the Beverly Hills School District in the development of their plan. Furthermore the city has utilized healthy communication networks with Area A cities, e.g. the four Westside cities Beverly Hills, Culver City, Santa Monica and West Hollywood. The cities have worked closely to share information and aid in development and creation of their respective plans. As part of the public process, the City worked closely with the Neighborhood Watch.

Neighborhood Watch

Neighborhood Watch meetings were conducted which covered the importance of Neighborhood Watch and how Neighborhood Watch relates to the elements of "Citizen Corp.", as well as, emergency preparedness, and a terrorism overview. A video presentation was also disseminated city wide over the City's Cable Channel. The topic for this year's presentation was "Homeland Security and You."

As shown in Appendix F, numerous opportunities were provided for public participation and input into the plan.

HOW IS THE PLAN 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 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. Council members 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 Hazard Mitigation Plan that remains current and relevant to City of Beverly Hills.

The mitigation plan is organized as follows:

EXECUTIVE SUMMARY: FIVE-YEAR ACTION PLAN

The Five-Year Action Plan provides an overview of the mitigation plan mission, goals, and strategies. The plan strategies 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.

PART I: MITIGATION ACTION PLAN

Section 1: Introduction

The Introduction describes the background and purpose of developing the mitigation plan for City of Beverly Hills and the planning process.

Section 2: Community Profile

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

Section 3: Risk Assessment

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

Section 4: Multi-Hazard Goals and Strategies

This section provides information on the plan goals and strategies that address the six hazards addressed in the mitigation plan.

Section 5: Plan Maintenance

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

PART II: HAZARD SPECIFIC INFORMATION
Hazard specific information on the six chronic hazards is addressed in this plan. Each of the hazard-specific sections includes information on the history, hazard causes and characteristics, hazard and risk assessment, area of susceptible to the hazard and existing mitigation activities and local, state, and national resources. The hazards addressed in the plan are as follows:

Section 6: Earthquake
Section 7: Fire
Section 8: Terrorism
Section 9: Flooding
Section 10: Earth Movement (Landslide)
Section 11: Windstorm

PART III: RESOURCES
Resources include, but are not limited to, all information used to gather information to assemble the entire Hazard Mitigation Plan.

Appendix A: Resources
This section provides a list of resources for City, regional, state, and federal agencies and organizations that may be referenced directly and indirectly within the City of Beverly Hills Hazard Mitigation Plan. The resources are also provided for public information.

Appendix B: Endnotes
This section provides the endnotes referenced in the various portions of the plan. The referenced number reflects the matching number in the endnotes with a corresponding source as to where that information was gathered.

Appendix C: Crosswalk
This section includes the Local Hazard Mitigation Plan Review Crosswalk for California local governments.

Appendix D: Natural Hazard Risk Analysis Rating Form
This section includes the survey by which community members rated the hazards.

Appendix E: Planning Meetings
This section provides a list of dates, descriptions and locations of all meetings pertaining to the planning process of the Hazards Mitigation Plan.

Appendix F: Public Involvement Meetings
This section provides a list of dates, descriptions and locations of all meetings that involved the community in the planning process of the Hazard Mitigation Plan.

Appendix G: Plan Adoption
This section contains a copy the Categorical Exemption and of the city Council Resolution adopting the Hazard Mitigation Plan.

SECTION 2
COMMUNITY PROFILE

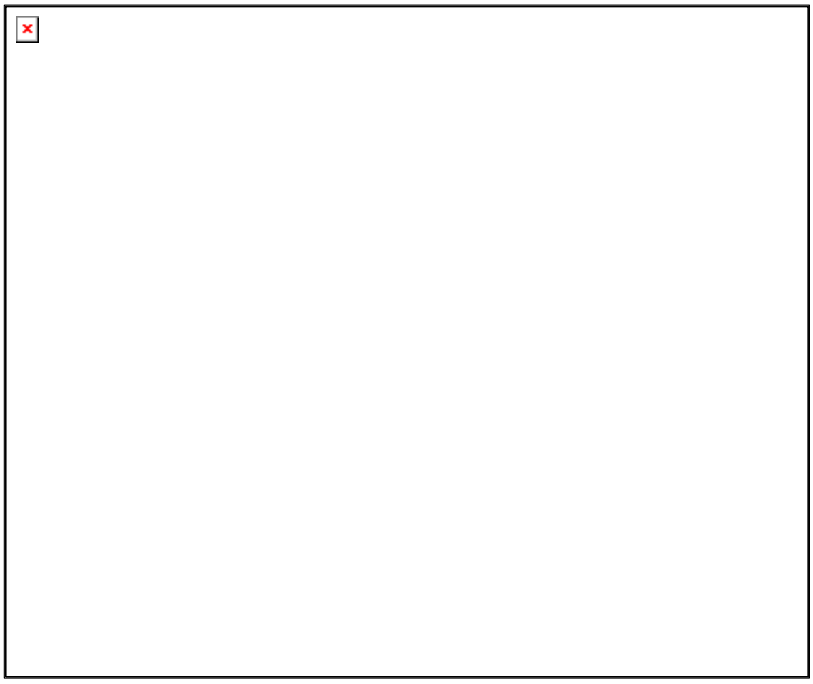
INTRODUCTION

The purpose of this document is to develop a plan for responding to hazards in the City of Beverly Hills. Hazards impact the City's citizens, property, the environment, and economy. Potential earth movements, earthquakes, flooding, terrorism, windstorms and fires expose residents and businesses to the financial and emotional costs of recovering under natural disasters. The risk associated with hazards increases as more people move to areas affected by these hazards.

Even in communities that are essentially "built-out" (i.e., have little or no vacant land remaining for development), population density continues to increase as lower density housing is replaced with higher density development.

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 hazard events. Identifying the risks posed by hazards and developing strategies to reduce potential impacts can assist in protecting the life and property of citizens and communities. Local residents and businesses can work together with the City to create a hazard mitigation plan that addresses the potential impacts of hazardous events.

Map 2: Geography and the Environment



The City of Beverly Hills is 5.7 miles in size. It is located within the area known as the "Westside" of Los Angeles County that includes West Hollywood, Culver City and Santa Monica. The area is fully urbanized and includes several business centers including Century City, Westwood Village and the Wilshire corridor.

The City's street system consists of a grid of local

streets (many serving as collectors), arterials, and other lesser thoroughfares. Regional access to the City is provided by San Diego (405) and the Santa Monica (10) Freeways. Major east/west arterials include Wilshire and Santa Monica and Olympic Boulevards. Major north/south streets include Beverly Drive, Doheny Drive, Robertson Boulevard and La Cienega Boulevard.

LAND AND DEVELOPMENT

Development in Southern California from the earliest days was a cycle of boom and bust. World War II, 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 fact 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's 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 City is currently working on an update of its General Plan.

CLIMATE

Beverly Hills enjoys a dry, sub-tropical, Mediterranean- like climate. Very little precipitation, low humidity, and an abundance of sunshine is enjoyed by residents, employees and visitors to the City. Virtually no precipitation is recorded between May and October, however an average of 15 inches of rain is measured annually. Monthly averages are shown in the following chart. (see Chart 3)

Chart 3: Average Temperatures

Month	High		Low	
January	67˚	19˚	45˚	7˚
February	67˚	19˚	47˚	8˚
March	68˚	20˚	48˚	19˚
April	70˚	21˚	51˚	11˚
May	72˚	22˚	54˚	12˚
June	74˚	23˚	58˚	14˚
July	78˚	26˚	61˚	16˚
August	79˚	26˚	62˚	17˚
September	79˚	26˚	60˚	16˚
October	76˚	24˚	56˚	13˚
November	72˚	22˚	50˚	10˚
December	68˚	20˚	46˚	7˚

Source: Western Regional Climate Center

MINERALS AND SOILS

Local soils conditions are discussed in the "Earthquake Hazards" chapter of this Report.

POPULATION AND DEMOGRAPHICS

Demographics

Approximately 90% of the City is zoned for residential use. In 2000, approximately 62% of the total dwelling units were apartments and condominiums, and 37% were single family houses. City records indicate that approximately 82% of the multi-family units are apartments and 18% are condominiums.

Employment and Industry
Major industries represented in Beverly Hills include Tourism, Entertainment, Financial Services, Hospitality, Professional Services, Real Estate and Retail.

The City of Beverly Hills is the largest employer in the city with approximately 1150 employees. Other major employers include the Regent Beverly Wilshire, Beverly Hilton, Peninsula and Beverly Hills hotels; the Beverly Hills Unified School District; Creative Artists, William Morris, ICM and United Talent Agencies; Neiman Marcus, Saks Fifth Avenue, Barney's New York, Robinsons-May and many other retailers; banks and investment firms; medical and law offices; service-related businesses (hair salons, day spas, etc); and restaurants.

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 hazard event, large and small businesses can develop strategies to prepare for hazards, respond efficiently, and prevent loss of life and property.

Daytime Population
Beverly Hills is a major center for employment in the economic sectors of tourism, hotel, retail, hospitality, and restaurant industries, as well as a center for legal, medical, financial and other professions. In addition to those employees and clients of these industries and professions who are both residents and non-residents, the City's daytime population includes a large number of people who must, by virtue of the City's geographic location, drive or take public transportation through the City to their places of employment and other destinations. Although it is difficult to determine the maximum number of people in or traveling through the City at any given moment, the following activities and people would make up the total daytime population:

- Employees of private businesses
- Hotel Guests
- Shoppers
- Restaurant clientele
- Professional clients
- Persons driving or taking public transportation
- Schools
- Day workers

Beverly Hills is a major job center for the region. The City's daytime population has been estimated as low as 110,000 and as high as 250,000, due in large part to the number of businesses located in the City **(3)**. The City's labor force consists of 18,430 people of the City's total population of 33,784 **(4)**.

All these people, resident and non-resident alike, are dependent in varying degrees on the City's ability to provide services, particularly in the event of a major disaster or emergency.
The Westside area of Los Angeles (Beverly Hills, Culver City, West Hollywood and Santa Monica) has approximately 10% of the jobs in Los Angeles County and approximately 6% of all county residents live here. Data on jobs/housing ratio indicates that more than 8% of the person-

miles traveled in the county traverse the Westside, which has only 6% of the county's lane-miles of roads (5).

Private automobiles are the dominant means of transportation in Southern California and in the City of Beverly Hills. However, since Beverly Hills is located in the middle of a large metropolis, a large number of buses and cars travel through the City each day on their way to bordering cities and regions. There is widespread intersection congestion throughout the Westside during the morning and evening peak commute periods.

General Demographic Information

The number of City residents has increased at a slow rate over the past thirty years, and growth predictions indicate that this trend will continue. A snapshot of demographics is provided below.

Chart 4: General Demographic Information

Subject	Number	Percent	Subject	Number	Percent
Total Population	33,784	100.00	Race		
Male	15,371	45.5	White		85.1%
Female	18,413	54.5	Asian		7.1%
Age			Two or more races		4.5%
0-19	7427	22.0%	African American		1.8%
20-44	11,362	33.6%	Other		1.5%
45-64	9,046	26.8%	Total		100%
65 years and over	5049	17.6%	Total Housing Units Total occupied housing units	15,856 15,035	
Median Age		41.3	Owner occupied housing units	6,518	
Number of Households			Renter occupied housing units	8,517	
Family Households		8,263	Homeowner vacancy rate	--	1.6%
Non-Family Households		6,772	Rental vacancy rate	--	3.3%
Total Households		15,035	Average Household size of		
Average Household Size		2.24 persons	owner-occupied units	2.73	
1990–2000 Change in Population		+5.7%	Average household size of		
1980-2000 Change in Population		+4.4%	Renter-occupied units	1.87	
1970-2000 Change in Population		+1.1%			

Source: 2000 U.S. Census

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GROWTH PROJECTIONS

The Southern California Association of Government's (SCAG) most recent population projection (prepared for the 2001 Regional Transportation Plan) projects that the City's population will be 34,547 in 2025, only slightly greater (approximately +.025%) than the 33,784 enumerated in the 2000 Census. Likewise, the employment projection, estimated at 56,667 in 2000, is only expected to reach 63,310 by 2025 (6).

By contrast, the population of Los Angeles County is expected to increase from 9.5 million people to 12.3 million people, almost a 30 percent increase. Employment in the County is expected to increase by almost 23 percent by 2025.

Within the six-county SCAG region, employment increases are generally not projected to be located near areas of population increase, implying substantially increased traffic congestion as people drive further to more distantly located jobs.

HOUSING AND COMMUNITY DEVELOPMENT, BUILDING AGE AND CONSTRUCTION TYPE

Beverly Hills, like many other communities in Southern California, was created as a real estate development in 1907. A substantial number of single family homes were constructed prior to 1920. The City's primary period of residential growth was in the late 1920s and 1930s.

Approximately 35 percent of the existing housing stock was built prior to 1940, and over 60 percent of the existing units were built prior to 1960. In contrast, only 13 percent of the County's housing stock in 1990 was constructed prior to 1940. The table below provides more data on housing construction dates.

Chart 5: Built Number of Units by Year

Year structure Built	Number of Units	Percent of Total Units
1999 to March 2000	47	.03
1995 to 1998	247	1.6
1990 to 1994	477	3.0
1980 to 1989	1,188	7.5
1970 to 1979	1,165	10.2
1960 to 1969	2,356	14.9
1940 to 1959	4,441	28.0
1939 or earlier	5,484	34.5
Total	**15,855**	**100.00**

Source: 2000 U.S. Census

Building age is important because building codes change over time in response to experience. By knowing the code under which a building was constructed, one can ascertain information about specific design requirements and construction types.

After the 1933 Long Beach Earthquake, the state adopted building code provisions for seismic safety. The law required all buildings to be designed for earthquake loads. The initial requirements were relatively low, but buildings designed to that standard still do have some load capacity.

An earthquake in the Puget Sound area in 1949 resulted in parapet correction requirements throughout the Los Angeles region. In the late 1950s, the Code's earthquake load was again increased based on experience gained over the years.

After the 1971 San Fernando earthquake, building codes underwent a major change in loads and detailing requirements to improve toughness and ductility in buildings. Toughness is the ability to sustain earthquake loads and ductility and the ability to rock back and forth with the ground motions without collapse or other failure. These changes were incorporated into the 1976 Code, which is still used as a benchmark for determining buildings that may require investigation and might pose a potential threat.

HOUSING NEEDS AND COSTS

Approximately 90 percent of the City is zoned for residential use. In the 1990 Census, 56 percent of the total units in the City were renter-occupied and 44 percent were owner-occupied. For condominiums, 74 percent were owner-occupied and 26 percent were renter-occupied.

As of January 1, 2000 there were a total of 15,890 dwelling units in the City. Approximately 63 percent were multi-family residential units, and 37 percent were single family detached units. City records indicate that approximately 82% of the multifamily residential units were apartments and 18% were condominiums **(7)**.

The City's current Housing Element includes an assessment of housing needs for the proper of January 1, 1998 – June 30, 2005. This need is summarized as follows:

Chart 6: Housing Needs and Costs

Total # of Households	By Income				By Percentage			
	Very Low	Low	Moderate	High	Very Low	Low	Moderate	High
256	35	42	40	139	14	16	16	54

Source: City of Beverly Hills Housing Element

Like other cities in California, housing costs have risen dramatically in the last five years due to falling interest rates and lack of supply. Single family housing prices for the past five years are shown below:

Year	Number of Homes Sold	Average Price
2004	277	1,842,656
2003	618	1,628,709
2002	645	1,468,757
2001	350	1,484,405
2000	417	1,583,377
1999	348	1,664,951

Source: DataQuik/Coldwell Banker

COMMUNITY DEVELOPMENT PROGRAMS

The City's Community Development Department oversees a number of activities in an attempt to respond to the housing needs of the community, particularly with regard to senior renters. City Staff implements these programs, which are funded through Community Development Block Grants (CDBG), which are summarized below **(8)**.

Handyworker Program (CDBG)

During the period running from January 1, 1998 through June 30, 2000, 90 existing dwelling units occupied by very low or low income households received rehabilitation work under this program.

Senior Homeshare (General Fund) and Senior Case Management (CDBG)
During this same period, 426 persons of all income ranges (with a majority of 80% being at or below 80% of Los Angeles County median income) received assistance. A total of 380 Section 8 rental certificates were issued or recertified. Most of these certificates are used by the residents of a 150-unit HUD Section 202 senior housing project.

Assistance to Homeless Persons (CDBG)
Assistance has been provided in the form of grants to service agencies to help with counseling, meals, medical needs, etc. Grants were provided to two nonprofit organizations to partially fund two homes shelters constructed and inter-jurisdictional efforts, and an outreach program to contact and provide assistance to homeless people on the street was implemented.

SECTION 3
RISK ASSESSMENT

The goal of mitigation is to reduce the future impacts of a hazard. Hazards can cause property damage, disruption to economics, and force the expenditure of large amounts of public and private funds to assist with recovery. However, mitigation should be based on risk assessment. Risk assessment is measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure and people. It identifies the characteristics and potential consequences of hazards, how much of the community could be affected by a hazard, and the impact on community assets. A risk assessment consists of three major components: hazard identification, vulnerability analysis and risk analysis.

FEDERAL REQUIREMENTS FOR RISK ASSESSMENTS

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 hazards profiled in the mitigation plan, including earthquakes, earth movements including landslide, flooding, fires (including wildland and structural), wind storms and terrorism. The Federal criteria for risk assessment and information on how the City of Beverly Hills Hazard Mitigation Plan meets those criteria is outlined in Table below.

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. The City developed maps identifying the location of the hazard in the City which appear throughout the plan and are listed in the table of contents.
Profiling Hazard Events	Each hazard section includes documentation of the history, and causes and characteristics of the hazard in the City which appear in the "history" section under each of the hazards in Part II of the plan.
Assessing Vulnerability: Identifying Assets	The "hazard identification" and "risk assessment" sections under each hazard in Part II of the plan provides a summary of the vulnerability assessment of each hazard and where data is available, contains the types and numbers of existing buildings, infrastructure and critical facilities exposed to each hazard.
Assessing Vulnerability: Estimating Potential Losses:	The calculations of the impact of the hazard and if data is available, the economic and physical losses, are discussed under the " What is susceptible to…" section under each hazard in Part II of the plan. 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 Beverly Hills Community 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.

WHAT IS RISK ASSESSMENT?
The City conducted a risk assessment by soliciting City Staff and community input as demonstrated by the following actions.

Hazard Identification
The Steering Committee discussed all possible natural hazards that may affect the City of Beverly Hills. Several sources participated in assessing which hazards are most likely to occur within the City of Beverly Hills and which ones would be most significant. Weighing the history, the probability, and the magnitude of each hazard to the City, the Steering Committee and Project Coordinators chose to incorporate the following natural hazards into the Mitigation Plan:

- Earthquake
- Earth Movement (Landslide/Debris Flow)
- Flood (including Reservoir Failure)
- Fire (including Wildland and Structural Fire)
- Windstorm
- At the request of the City Manager and the Police Chief, Terrorism was also added.

Community
In another informal survey, the staff and community members were asked to rank the hazards list from most likely to least likely to occur in the City of Beverly Hills. The following is the tabulation of those polled:

1. Earthquake
2. Terrorism
3. Fire
4. Flood
5. Land Slide
6. Wind Storm

A sample of the survey form is attached in Appendix D.

Online Risk Analysis
An online program, which provides a template for a Hazard Mitigation Plan, has a method of tabulation that considers the probability, magnitude/severity, the duration and warning time for each hazard and then produces a Critical Priority Risk Index. The program ranked the following hazards in order of significance and likelihood:

Chart 7: Risk Analysis

Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Priority Risk Index
Terrorism	Possible	Limited	Less 6 Hours	More than one week	2.5
High Winds/Straight Line Winds	Possible	Negligible	12-24 Hours	Less than one day	1.7
Earthquake	High Likely	Catastrophic	Less 6 Hours	More than one week	4
Flooding	Possible	Negligible	6-12 Hours	Less than 6 hours	0.85
Landslide	Unlikely	Limited	24+ Hours	Less than one week	1.5
Wildfires	High Likely	Catastrophic	Less 6 Hours	More than one week	4

Source: www.mitigationplan.com Critical Priority Risk Index template

Earthquake and Wildfire tied in first to be the likely and most devastating hazards to occur within the City of Beverly Hills. Based on these three assessments and the Steering Committee approve the top three hazards to the City of Beverly Hills are as follows: Earthquakes, Fires including wildland and structural fires, and Terrorism.

OTHER NATURAL DISASTERS

There are a number of possible disasters that can happen at any given time, at any given place. However, based on historical analysis the probabilities were narrowed down to five natural and one manmade disasters that are most common or likely to occur within the City of Beverly Hills. The following two natural disasters are not ruled out as possibilities, but are categorized as not very likely to occur.

Natural

Tsunami

A tsunami has never occurred within the city of Beverly Hills. Although the city enjoys a close proximity to the ocean, there is no record of a Tsunami or repercussions of. State data shows that although the City of Beverly Hills would sustain some water if as Tsunami hits the Southern California Coast, it would have little to no affect on the city.

Drought

The region of Southern California is currently undergoing a six year drought however there are no accounts that indicate a serious threat to life or property due to a drought within the city.

Manmade

The only manmade disaster that is included in the plan for the City of Beverly Hills is terrorism. The City has been preparing diligently to prevent this type of catastrophe. The following are possibilities, as all disasters are, but the likelihood based on history and the affect they would have on life or property have been taken into consideration.

Power Outage
Power services are provided to the city by Edison International. Power outages can occur whenever there is a severer disruption to the power lines or grid. For instance during a severe storm, an earthquake and/or wildfire. The city is equipped with back up generators in case of a power outage. City buildings, including the Fire, Police, Public Works and City Hall are backed by fully ready and capable generator in case the power source is disrupted.

Power outages do occur in the city whether associated with a disaster or not. Edison's aging infrastructure often causes power outages within sections of the city. Edison has and continues to work to replace this infrastructure thus causing a decrease in outages.

Aircraft Crash
The airports nearest to the City of Beverly Hills, which handle the greatest amount of air traffic, are Santa Monica Airport, Los Angeles International Airport, Long Beach Airport, John Wayne Airport, Ontario Airport, and Burbank Airport. The City has recently seen an increase of aircraft over the City however no commercial airlines fly over the city. Most of these aircraft are small airplanes or helicopters departing from or landing at Santa Monica Airport. There is no record of a plane crash within the city.

Civil Unrest
Though Los Angeles County experienced a Civil Unrest in 1992, the City of Beverly Hills suffered no loss of life or property. There is only one history of repeated civil unrest within the City of Beverly Hills which is addresses more thoroughly in the Terrorism section of this plan.

Hazardous Material Accidents
The City of Beverly Hills could be affected by hazardous materials incidents. The spills/releases of material can result from both stationary and mobile sources. The level of exposure from stationary sources is considered to be very low, due to the types of business and industry conducted within the City. The exposure to the City from mobile sources is slightly higher, due to the types of thoroughfares within the City, Santa Monica Blvd., which crosses through the center of the City. There is no record of a hazard material spill or incident in the City. Because of the low probability and the lack of mitigation need the Steering Committee did not address this disaster.

PROFILING HAZARDS
This process describes the causes and characteristics of each hazard, how it has affected City of Beverly Hills in the past, and what part of the City of Beverly Hills'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 and City's vulnerability, see the appropriate hazard chapter.

ASSESSING VULNERABILITY, ESTIMATING POTENTIAL LOSSES, AND INVENTORYING ASSETS
Assessing vulnerability is a three step process. First, we must identify existing structures and critical facilities that are located within the hazard area.

Government critical facilities are of particular concern because these buildings provide essential products and services to the general public that are necessary to preserve the welfare and quality of life in the City and to fulfill important public safety, emergency response, and/or disaster recovery functions. The list of government critical facilities have been identified and are listed as follows. The City of Beverly Hills has mitigated or will be mitigating most of the issues identified in these government critical facilities.

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

CRITICAL FACILITES AND INFRASTRUCTURE

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. The list and maps on the following pages illustrate the critical facilities, essential facilities, public infrastructure, and emergency transportation routes within the City of Beverly Hills. The following is a list of government owned Critical Facilities within City of Beverly Hills.

GOVERNMENT FACILITES

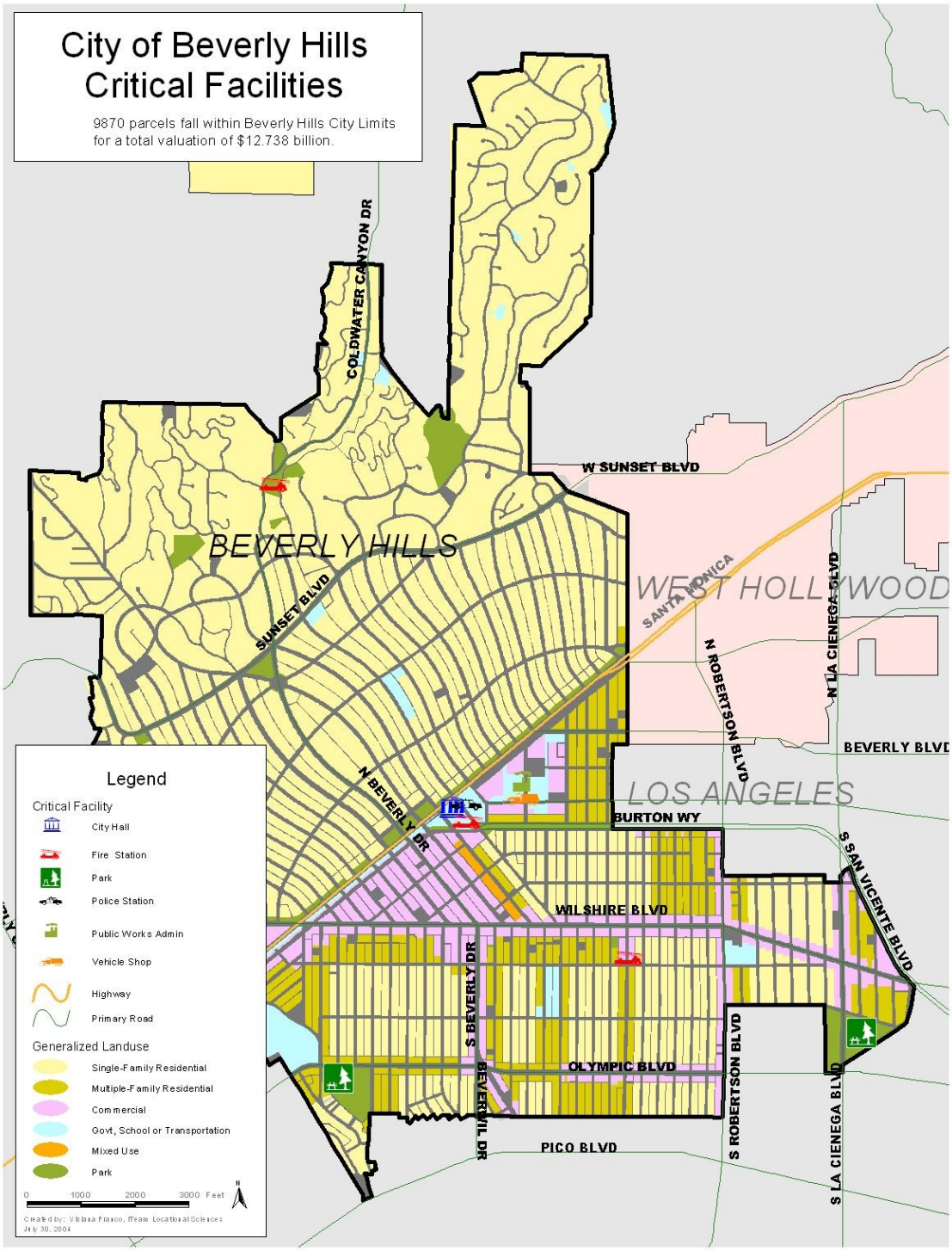
Roxbury Park
Size: 15900 sqft.
Facility Description: Use: Recreation facility and emergency shelter
Estimated Value: $2,250,000
Location:
471 S. Roxbury Drive,
Beverly Hills , CA 90210

Beverly Hills City Hall
Government Facilities
Size: 68000 sqft.
Facility Description: Uses: Administration and General Government
Current Value: $13,297,000
Location:
455 N. Rexford Drive,
Beverly Hills, CA 90210

Operations Service Center
Government Facilities
Size: 68000 sqft.
Facility Description: Use: Vehicle and Facilities repair, fuel, Public Works operations support
Estimated value: $13,482,000
Location:
331/333 N Foothill Road,
Beverly Hills, CA 90210

La Cienega Park
Government Facilities
Size: 9400 sqft.
Facility Description: Use: Recreation facility and emergency shelter
Estimated Value: $13,953,000
Location:8400 Gregory Way,
Beverly Hills, CA 90210

Map 3: Critical Facilities



Fire Headquarters Station
Fire Stations
Size: 45000 sqft.
Facility Description: Use: Fire Operations and Ad ministration
Estimated Value: $11,332,000
Location:
445 N. Rexford Drive,
Beverly Hills, CA 90210

Fire Station #2
Fire Stations
Size: 6300 sqft.
Facility Description: Use: Fire operations
Current Value: $1,801,000
Location:
1100 N. Coldwater Canyon Drive,
Beverly Hills, CA 90210

Fire Station #3
Fire Stations
Size: 14000 sqft.
Facility Description: Use: Fire operations
Current Value: $1,750,000
Location:
180 S. Doheny Drive,
Beverly Hills, CA 90210

Police Department
Police Stations
Size: 92000 sqft.
Facility Description: Use: Police operations and administration
Estimated Value: $27,420,000
Location:
464 N. Rexford Drive,
Beverly Hills, CA 90210

Public Works Facility
Water and Sewer
Size: 43000 sqft.
Facility Description: Use: Public Works operations, administration and water treatment plant
Estimated Value: $20,000,000
Location:
345 Foothill Road
Beverly Hills, CA 90210

CRITICAL INFRASTRUCTURES

Roadways and Bridges
Interstate Highway No. 2, (Santa Monica Boulevard) is the only highway traversing through Beverly Hills. This section of Highway 2 is constructed on street grade and has no elevated bridges. There are 143 miles of public streets and alleys in Beverly Hills. There are four major arterials in Beverly Hills, Sunset, Wilshire, Santa Monica and Olympic Boulevards. These major streets are reconstructed or resurfaced within the last 10 years. All the public streets and alley are old and they are maintained under the City's Pavement Management Program. In the event that the street is damaged in a disaster, the roadway will be repaired in a timely manner by the City's Street Maintenance division or outside Contractor.

The City of Beverly Hills also has identified non-government facilities that are critical to the City of Beverly Hills such as the hotels, schools (which will complete a separate plan), restaurants and other large businesses in the City. These facilities are not listed here but it is recognized that these businesses are essential to the well being of the City and mitigation efforts surrounding these businesses and buildings are strongly encouraged. A list of these buildings can be found in the Disaster Plan and in the Administrative Services Department. A list of business tax revenue is available if needed.

POTENTIAL EFFECTS OF HAZARDS ON THE BUILT ENVIRONMENT

Subtle but very measurable changes occur constantly in all communities. These changes can increase the degree of loss that could occur due to a major disaster. A number of factors contribute to this potential increased degree of loss:

- As the population increases, a greater number of people are susceptible to risks within a defined geographic space.
- Inflation constantly increases the worth of real property and permanent improvements.
- The amount of property owned per capita increases over time. The following chart compares average housing standards for the years 1975 and 1998.

Chart 8: Amount of Property per Person

Amount of Property per person	1975	1998
Average 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

HOW BUILDING VALUES WILL BE AFFECTED

The City's building stock's assessed valuation is significant. In addition to the potential loss of buildings (brick and mortar), indirect losses from specific occupants can also be anticipated. For example, "business interruption," which is not usually discussed in damage reports, may have been the largest loss caused by the Northridge earthquake.

Safety services and administrative costs associated with closed structures could be considerable and would depend in part on owner cooperation. The City would also incur costs for the cleanup of public property **(9)**.

COMMERCIAL STRUCTURE VALUATION

The City's commercial stock consists of approximately 885 buildings. For Year 2001-2002, valuation of the commercial stock of pre-1976 Code buildings is approximately $2,250,000. Post-1976 buildings are approximately $609,000,000. This does not include the land value, which is estimated at $2.2 billion. Other factors to consider include:

- Less-affected buildings in areas of substantial damage will lose value due to the loss of neighborhood value.
- When a commercial structure is destroyed, the City loses much of the property tax on that parcel for a significant period of time until a replacement building is in place.
- Sales tax is lost. If a professional office structure is constructed to replace a retail structure, the sales tax would not be regained.

MULTI-FAMILY RESIDENTIAL STRUCTURES

The City has approximately 1,565 multi-family residential structures. Approximately 95% of these were constructed prior to the adoption of the 1986 Code standards. This construction type has a valuation estimated to be $1,000,000,000. Improvements are estimated to be $371,000,000

of this total amount. The City estimates that approximately 70% of multifamily residential structures are considered to be potentially at risk. Construction types include the following:

- **Unreinforced Masonry structures.** In 1989, the City enacted a mandatory retrofit program. Each of the 90 buildings identified under this program has been strengthened.

- **Wood Frame Buildings**. Most early wood frame structures are not connected to their foundations with anchor bolts which could allow buildings to slide off their foundations. Others are constructed on short wood studs between the first floor and the foundation using cripple stud walls. This type of construction can collapse and topple, dropping the building to the ground. There are over 1,000 buildings with either of these potential deficiencies. Approximately 6,500 dwelling units, housing over 12,000 residents, are potentially at risk.

- **Wood Frame Buildings with Soft Story and/or Tuck-under Parking.** Many multi-family residential buildings have an at-grade parking level directly under the building which is supported on small round or square columns. Prior to the 1976 Code, there were no provisions to control the amount of movement of these support columns. Excessive movement of these columns can result in collapsed garages. Injuries, loss of life and a partial or complete building collapse could occur. Damage of this type resulted in deaths at the Northridge Meadows apartment building in the 1994 Northridge earthquake. Approximately 450 buildings with this weakness have been identified in the City. These buildings contain 2,315 dwelling units, housing approximately 4,400 residents.

TOTAL NUMBER OF BUILDINGS IN BEVERLY HILLS
The total number of Residential Housing Units per 2000 U.S. Census: 15,855. Of this amount, 6,000 are single family units and 2,191 (including 626 garage structures) are multi family units. There are 1,565 commercial buildings (many of which contain multiple tenants). The total value of buildings in Beverly Hills: $12.738 billion (9870 parcels). (Note: This number is based on the most recent Los Angeles County Assessor's valuation as of the date this report was written. If the number was calculated using $150/s.f. as a replacement cost for square footage for all buildings in Beverly Hills, the total would be approximately $15.3 billion.) **(11)**

Of the 9,870 parcels, many buildings and structures are located within hazard zones. The following information assesses a fiscal amount on the properties.

BUILDINGS AND VALUATION IN HAZARDS AREAS
The City of Beverly Hills contains a significant amount of property in hazard areas. The following estimated figures are based on the City's most recent information from the Los Angeles County Tax Assessor's Office.

Very High Fire Hazard Severity Zone (VHFHSZ).
Approximately 1640 single family residences are located within this zone.
Estimated valuation: $2.99 billion.

Flood Zone
1233 parcels (a mix of commercial, single and multi-family) are located within the City's Flood Zones. Estimated Valuation (improvements only): $1.09 billion.

Landslide Areas
668 parcels fall within the landslide areas with a total valuation of $1.008 billion.

Liquefaction Areas
3119 parcels fall within the liquefaction areas with a total valuation of $2.44 billion.

**Note: Given the uncertain nature of a terrorist attack on a specific building, infrastructure, etc. a specific valuation number cannot be provided. **

CAPABILITY ASSESSMENT
The following practices, ordinances and policies current steps practiced by the City of Beverly Hills to facilitate the mitigation process. The ordinances and codes are used in a proactive manner to stand as preventative measures.

Storm Water Management Ordinances: Yes
Stream Management Ordinances: No
Zoning Management Ordinances: Yes
Subdivision Management Ordinances: No
Erosion Management Ordinances: No
Floodplain Management Ordinances: No
Elevation Certificates Maintained: Yes
National Flood Insurance Program Community: No
Land Use Plan: Yes
Land Use Plan Last Update: 5/17/1977
Community Zoned: Yes
Established Building Codes: Yes
Building Codes Last Updated: 12/19/2002
Type of Building Codes: California Building Code
Local Electric Utilities: Southern California Edison
Local Water Utilities: City of Beverly Hills
Local Sewage Treatment Utilities: City of Los Angeles
Local Natural Gas Utilities: Southern California Edison
Local Telephone Utilities: Pacific Bell
Fire Insurance Rating: ISO Rating, Class 1
Fire Insurance Rating Date: 7/01/2001

ASSESSING VULNERABILITY/ANALYSING DEVELOPMENT TRENDS
The last step in assessing the City's vulnerability to hazards is to analyze development trends in the city – This process provides stakeholders a basis in making decisions on the type of mitigation approaches to consider and the locations in which mitigation should be approved.

The development trends analysis is contained in the Community Profile Section of the plan.

This plan provides comprehensive description of the character of City of Beverly Hills. Information 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 Beverly Hills helped in identifying potential problem areas, and serves as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

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. Strategies throughout the hazard sections provide recommendations to collect further data to map hazard locations and conduct hazard assessments.

Summary
Hazard mitigation strategies can reduce the impacts concentrated around businesses, public infrastructure, and critical facilities. 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 hazards.

SECTION 4
MULTI-HAZARD MISSION STATEMENT, MISSION, GOALS AND STRATEGIES

This section describes the framework that focuses the plan on developing successful mitigation strategies. The framework is made up of three parts: the Mission, Goals, and strategies. The Steering Committee and the Project Coordinators developed and approved the mission, goals and strategies of the plan. These were all approved in the public process.

MISSION
The City of Beverly Hills Hazard Mitigation Plan is to promote sound public policy and programs designed to protect the public, critical facilities, infrastructure, private and public property and the environment from natural and manmade hazards. This will be achieved by developing and implementing this plan to guide the City towards creating and maintaining a safer more sustainable community.

GOALS
The plan goals describe the overall direction that City of Beverly Hills agencies, organizations, and citizens can take to minimize the impacts of hazards. The Plan goals help to guide direction of future activities aimed at reducing risk and preventing loss from hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations that are outlined in the strategies. The following are the plan goals.

PLAN GOALS
To Protect Life, Property, Environment

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to hazards.

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

Encourage preventative measures for existing and new development in areas vulnerable to hazards.

Public Awareness

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

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

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

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.

Assist in the development of the Safety Element of the General Plan

Emergency Management

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

Update current ordinances, make recommendations for City guidelines, codes, and permitting process and establish new ordinances that support mitigation.

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

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

HAZARD MITIGATION STRATEGIES

The mitigation plan identifies strategies developed and submitted through data collection, 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. To help ensure activity implementation, each action item includes information on the time line and coordinating organizations.

Constraints may apply to some of the strategies. 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.

The following chart summarizes the Hazard Mitigation Strategies for the City of Beverly Hills. The chart contains the coordinating departments, the timeline and the plan goals each hazard addressed. These items were submitted from various departments within the city and carefully planned, reviewed and approved by the Steering Committee. The strategies were developed based on department goals, data collection, research and public participation process.

Chart 9. MITIGATIONS STRATEGIES OVERVIEW CHART

Lead departments denoted in **BOLD**

Hazard	Mitigation Strategy	Responsible Department	Timeline	Plan Goals Addressed			
				To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Earthquake	**1. Earthquake Mitigation** Evaluate Mel Green Report	Community Development	2007	X	X	X	X
Earthquake	**2 Seismic Modifications for Water System Reservoirs and Pump Stations** Improve seismic deficiencies by retrofitting piping, valves, tanks, and pump stations	Public Works	2005	X			X
Earthquake	**3. Operations Service Center Building Mitigation**	Public Works	2006	X			
Earthquake	**4. Update the Safety Element of the General Plan** Update the Safety Element of the General Plan	Planning	2006	X			X
Fire	**5. FireWise Program** To create a sustainable balance that will allow communities to live safely while maintaining environmental harmony in a wildland/urban interface setting by implementation of Firewise Program.	**Public Works**, Engineering & Trans., Fire	2006	X	X	X	X
Fire	**6. Wildland Interface Task Force** Establish a Wildland Interface Task force to implement Firewise programs.	Fire	2006	**X**	X	X	X
Fire	**7. Code Update** Review and update existing city codes to reflect recommendations set forth by the FireWise assessment and Joint Wildland Interface Task Force.	**Community Development**, **Fire**	2006	**X**	X	X	X
Fire	**8. Zone 9 (Closed water Pressure Zone) Hillside Fire Protection** To increase water pressure and access to water in case of an emergency. The project will increase water supply reliability and capacity in Zone 9 for conflagrations in the vicinity of Coldwater Canyon and areas contiguous to the City and the City of Los Angeles' Franklin Canyon Reservoir.	Fire	2005	X		X	X
Terrorism	**9. Police Officer Training** Train and equip all police officers to operational level	Police	2005	X			X
Terrorism	**10. First Responder** Train and equip all first responders and field personnel to awareness level	**Police,** Office of Emergency Management (OEM), All Departments	2005	X			X
Terrorism	**11. Risk Assessment** Assist City staff with critical facilities assessment	**Police**, OEM	2006	X			X

Hazard	Mitigation Strategy	Responsible Department	Timeline	Plan Goals Addressed			
Terrorism	**12. Target Hardening** Upgrade city facilities to improve security	**Police,** OEM, Community Development, Engineering & Trans., Project Administration	2006	X			X
Terrorism	**13. Terrorism Liaison** Participate in Terrorism Early Warning Group	**Police, Fire**	2004	X			
Terrorism	**14. Cyber-Terrorism Prevention -** Upgrade Information Technology Security infrastructure and upgrade disaster recovery	Information Technology	2007	X		X	X
Terrorism	**15. Terrorism Public Awareness** Provide community outreach and education to individuals and businesses concerning actions they can take in preparation for possible terrorist events.	**Police**, OEM, Community Relations	2006			X	X
Flood	**16. Storm Drain System Improvements** Locate facilities throughout the city that will facilitate mitigation deficiencies defined in the Storm Drain System Master Plan.	**Public Works** , Engineering & Trans.	2009	X	X		X
Flood	**17. Flood Ordinance Revision** Update the Flood Ordinance	**Engineering & Transportation** Community Development/ Building & Safety	2008		X		X
Landslide	**18. Geotechnical Investigation** Conduct additional geotechnical investigation to update the landslide hazard maps in the City of Beverly Hills to improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.	**Engineering& Transportation,** Community Development	2007	X			
Landslide	**19. Hillside Development Construction** Encourage application of designs and construction technologies for steep slopes to reduce the potential adverse impacts from development	**Engineering and Transportation,** Community Development	On going			X	
Landslide	**20. Public Outreach of Landslide** provide information to educate residents to prevent landside on hillside slopes.	**Engineering & Transportation,** OEM**,** Communication Department, Public Works	2005		X		

Hazard	Mitigation Strategy	Responsible Department	Timeline	Plan Goals Addressed			
Windstorm	**21. Public Awareness Campaign** Provide public education materials to City of Beverly Hills 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.	**Recreation & Parks**, Communications and Marketing, OEM	On going 2006	X	X	X	
Windstorm	**22. Tree pruning and Fire Code Sections** Create local City and utility awareness of tree pruning and Fire Code Sections relevant to wind-resistant utility operations.	**Fire**, Community Development, Public Works, OEM, Recreation & Parks, Engineering & Trans.	2009			X	
Windstorm	**23. Equipment Testing** Encourage Critical City Facilities to purchase and/or test backup power facilities for use during a power failure.	Public Works	Ongoing			X	
Multi-Hazard	**24. Conservation Classroom** To educate the community about water conservation so water resources are available as demands increase and/or supply decreases	Public Works	2007		X	X	
Multi-Hazard	**25. Emergency Alert System Upgrade** To purchase, install and integrate additional equipment to make the necessary upgrades to the system so that the cable TV warning system will have the capability to notify all cable television subscribers with in the City.	Information Technology	2008	X	X		X
Multi-Hazard	**26. Business Community Awareness Program** Provide education on Hazard Mitigation and preparedness to business community.	**OEM**, Communication & Marketing	2007	X	X		
Multi-Hazard	**27. Citizen Corp** Expand the City's citizen Corps Program	**OEM**, Fire, Police	2006		X	X	X
Multi-Hazard	**28. Emergency Evacuation Routes** Identify safe evacuation routes in high-risk debris flow and landslide areas.	**Police**, Fire, Engineering & Transportation **,** Public Works, OEM	2005	X			X
Multi-Hazard	**29. Alley Clearance**	**Public Works**, Recreation & Parks	On going	X	X	X	X

HOW ARE THE STRATEGIES ORGANIZED

The strategies are a listing of activities in which City departments and citizens can be engaged to reduce risk.

The strategies are organized within the following matrix, which lists all of the multi-hazard and hazard-specific strategies included in the mitigation plan. Data collection and research and the public participation process resulted in the development of these strategies. The matrix includes the following information for each strategies:

HAZARD	**The hazard the strategy mitigates.**
PROJECT NAME	**Name of the mitigation project/strategy.**
DESCRIPTION	**Strategy Description**
ACTION ITEM	**What actions will be completed to complete the strategy.**
COORDINATING DEPARTMENT	**The department with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. The main department responsible is in bold, the supporting departments are not.**
IDEAS FOR IMPLEMENTATION	**Each project includes ideas for implementation and potential resources, which may include grant programs or human resources.**
TIMELINE/COMPLETION DATE	**Each project includes an estimate of the time line for implementation.**
TOTAL COST	**Estimate of cost of project.**
FUNDING SOURCE(S)	**Where the funding will be obtained.**
CONSTRAINTS	**Constraints may apply to some of the action projects. These constraints maybe 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**

PLAN GOALS ADDRESSED **The plan goals addressed by each project are included as away to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins**.			
	Public Awareness		Protect Life and Property
	Partnerships and Implementation		Emergency Management

MITIGATION STRATEGIES BY HAZARD

The following are the detailed mitigation strategies for the City of Beverly Hills. The mitigation strategies here are organized in the following order: Earthquake, Fire, Terrorism, Flood, Landslide, Windstorm. and Multi-Hazard. Strategies marked multi-hazard are projects that would mitigate multiple hazards.

Chart 10: Built Detailed Mitigation Strategies

EARTHQUAKE

Hazard	Earthquake		
Project Name	**Earthquake Mitigation**		
Description/Strategy	Evaluate Mel Green Report		
Action Items	Study suggested mitigation strategies produced by Melvyn Green Associates: Buildings with tuck-under parking that constitutes a soft-story should be strengthened to prevent collapse. Wood buildings with short cripple studs under the first floor should have wall bracing installed from the foundation to the first floor. Wood buildings constructed without positive connection from the foundation to the structure should have anchor bolts installed. All pre-1981 non-ductile concrete frame buildings three stories or more in height should be seismically rehabilitated. "Soft-Story" buildings, three stories or greater and constructed prior to 1981 should be strengthened. Tilt-up concrete wall buildings are to be retrofitted to reduce the chance of walls falling outward. Encourage owners to strengthen open front low rise concrete and masonry buildings. Buildings in liquefaction zone to be reviewed for risk of damage and injury.		
Coordinating Department	Community Development		
Ideas for Implementation	Unknown at this time.		
Timeline/Completion Date	2007		
Total Cost	Unknown		
Funding Source(s)	Various		
Constraints	Funding.		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

Hazard	Earthquake
Project Name	**Seismic Modifications for Water System Reservoirs and Pump Stations**
Description/Strategy	Improve seismic deficiencies by retrofitting piping, valves, tanks, and pump stations
Action Items	Install automated control valves on inlet/outlet piping system

	to reservoirs Anchor reservoirs to foundation Install inlet/outlet piping to reservoirs and pumps Install structural improvements in reservoirs		
Coordinating Department	Public Works		
Ideas for Implementation	Currently being implemented		
Timeline/Completion Date	2006		
Total Cost	$1,946,000 –Funded 04-05 + 05-06		
Funding Source(s)	Water Enterprise Fund		
Constraints	Project design and construction scheduling Project approval		
Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

Hazard	Earthquake		
Project Name	**Operations Service Center Building Mitigation**		
Strategy	Replace vehicle shop and 3 additional buildings.		
Action Items	1. Merge 4 buildings into 2 eg. The Public Works Operations Building 2. Demolition of old buildings		
Coordinating Department	Public Works		
Ideas for Implementation	N/A		
Timeline/Completion Date	2006		
Total Cost	$16 Million		
Funding Source(s)	Capital Assets and Hazard Mitigation Grant Money		
Constraints	None		
Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

Hazard	Multi-Hazard
Project Name	**Safety Element of the General Plan**
Strategy	Update the Safety Element of the General Plan
Action Items	Hire consultants to write/update the Safety Element of the General which includes seismic subject matters.
Coordinating Department	Planning
Ideas for Implementation	Hire consultant to prepare plan. Technological & public hearing process.
Timeline/Completion Date	2007

Total Cost	$10,000		
Funding Source(s)	Various		
Constraints	Time, Funding		
Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

FIRE

Hazard	Fire
Project Name	**FireWise Program**
Description	To create a sustainable balance that will allow communities to live safely while maintaining environmental harmony in a wildland/urban interface setting by implementation of Firewise Program. The following issues will be studied and goals to be considered.
Action Items	Replacement of flammable wood roofs with non-flammable Class A roofs. Maintain vegetation properly by removing dead accumulations. Properly maintain the eucalyptus: Clearing dead material from around the tree and off the house. Remove bark strips within 6-8 feet of the ground. Remove lower branches that hang within 6-8 feet from the ground. Remove beards from palm trees. Planning or modifying a home landscape, homeowners should use non-flammable vegetation. Use structural modifications to reduce fire intensity. Maintain vegetation and remove dead vegetation from under cantilevered structures. Maintain roofs and gutters free of dead material. Spanish tile roofs should be closed along the edges. Vegetation adjacent to homes should be well watered and devoid of dead material. Hedges of juniper or deodar cedar should be well separated from the structure. Establish a “fire free zone” allowing no fire to burn within 10 feet of a house. During high Santa Ana winds do not leave flammable items outside. This includes rattan doormats, flammable patio furniture, firewood stacked next to the house, or other flammables. Public Education programs for the homeowners. Observe a FireWise communities/USA day each spring that is dedicated to a local FireWise project.
Coordinating Department	Fire
Ideas for Implementation	Form the FireWise Committee to create an action plan to implement the area-specific solutions to the Wildland/Urban Interface Problems.

Timeline/Completion Date	FY 2005		
Total Cost	$2/capita (north of Sunset Blvd.)		
Funding Source(s)	Grants, General Fund		
Constraints	None		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

Hazard	Fire		
Project Name	**Wildland Interface Task Force**		
Description	Establish a Wildland Interface Task force to implement Firewise programs and to develop additional training needs..		
Action Items	Develop goals and objectives for task force Identify wildland interface threats Develop joint mitigation plan Implement mitigation plan		
Coordinating Department	Fire		
Ideas for Implementation	Review plan on quarterly basis		
Timeline/Completion Date	FY 2006		
Total Cost	None at this time – Unknown for future		
Funding Source(s)	General Fund		
Constraints	None		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

Hazard	Fire
Project Name	**Code Update**
Description	Review and update existing city codes to reflect recommendations set forth by the FireWise assessment, the Joint Wildland Interface Task Force, and ordinances in high rise buildings..
Action Items	Review existing codes relevant to fire protection and prevention in the wildland interface and in high rise commercial and residential buildings. Rewrite codes to reflect new recommendations Submit new codes for approval Enforce new codes
Coordinating Department	**Community Development, Fire**
Ideas for Implementation	N/A
Timeline/Completion Date	Spring 2006

Total Cost	Staff time		
Funding Source(s)	General Fund		
Constraints	Time		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

Hazard	Fire
Project Name	**Zone 9 (Closed water Pressure Zone) Hillside Fire Protection**
Strategy	To increase water pressure and access to water in case of an emergency. The project will increase water supply reliability and capacity in Zone 9 for conflagrations in the vicinity of Coldwater Canyon and areas contiguous to the City and the City of Los Angeles' Franklin Canyon Reservoir. It will also improve distribution of water supply and reduce energy costs at the Monte Cielo pump station for domestic service into Zone 9.
Action Items	Solidify a water transfer agreement specifically for system integration and supplemental fire protection between the cities of Beverly Hills and Los Angeles. The City of Los Angeles will design and construct the required capital improvements. The City of Beverly Hills will finance the improvements as part of the terms and conditions of the agreement. In addition, the City of Beverly Hills will design and construct separate water lines for fire hydrants and domestic service in this area.
Coordinating Department	**Public Works, Engineering & Transportation, Fire**
Ideas for Implementation	Same as action items.
Timeline/Completion Date	2006
Total Cost	$2.5 - 3 million
Funding Source(s)	Water Enterprise Fund
Constraints	Coordination with the City of Los Angeles' Department of Water and Power.

Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

TERRORISM

Hazard	Terrorism
Project Name	**Police Officer Training**
Description	Train and equip all police officers to operational level
Action Item	Conduct training and purchase equipment
Coordinating Department	Police

Ideas for Implementation	Schedule Classes		
Timeline/Completion Date	2005		
Total Cost	Back Fill Positions		
Funding Source(s)	Budget, Grants		
Constraints	None		
Plan Goals Addressed		X	Protect Life and Property
	Public Awareness		Natural Systems
	Partnerships and Implementation		Emergency Management

Hazard	Terrorism		
Project Name	**First Responder**		
Description	Train and equip all first responders and field personnel to awareness level		
Action Item	Conduct training and purchase equipment		
Coordinating Department	**All City Departments**)		
Ideas for Implementation	Schedule Classes.		
Timeline/Completion Date	2005		
Total Cost	$10,000		
Funding Source(s)	No cost/ Employee Time Only		
Constraints	Time		
Plan Goals Addressed		X	Protect Life and Property
	Public Awareness		
	Partnerships and Implementation	X	Emergency Management

Hazard	Terrorism		
Project Name	**Risk Assessment**		
Description	Assist City staff with critical facilities assessment and target hardening.		
Action Item	Conduct threat assessment surveys of critical locations		
Coordinating Department	**Police**, OEM		
Ideas for Implementation	-Assign item to Sergeant. -Hire a consultant.		
Timeline/Completion Date	2006		
Total Cost	None unless the city hires a consultant.		
Funding Source(s)	Budget		
Constraints	Time.		
Plan Goals Addressed		X	Protect Life and Property
	Public Awareness		
	Partnerships and Implementation	X	Emergency Management

Hazard	Terrorism		
Project Name	**Target Hardening**		
Description	Upgrade city facilities to improve security		
Action Items	Police Facility Create a second exit for Police (from garage to Civic Center Drive) as an alternate means for Police to exit the facility should the Rexford Drive access become blocked or disabled. Construction is anticipated in the summer 2005.– conceptual designs have been developed to show a 12' wide driveway Add electronic remote doors to Main entrance doors additional Surveillance cameras and monitors –to support the night-time lock down operation Install Video recording system – to reinforce overall safety of the Police department City Hall develop a permanent guard station for visitor check-in for City Hall entrance Install Metal Detectors – equipment could be placed at the Rexford Drive entry point. Further analysis and proposal to consider this option is recommended by a qualified security consultant. Civic Center Reconfigure the roadway at Rexford Drive and Civic Center to resemble a standard "T" intersection to improve safety for pedestrians accessing the facilities. Replace access control system at City Hall, Police Facility and Library –Implementation of a new system in conjunction with Information Technology, and is expected to occur over the next two fiscal years.		
Coordinating Department	Police, OEM, **Project Administration**, Transportation & Engineering		
Ideas for Implementation	Administration will work with consultant to harden targets.		
Timeline/Completion Date	2005		
Total Cost	None		
Funding Source(s)	Budget/CIP		
Constraints	-Funding -Time		
Plan Goals Addressed		X	Protect Life and Property
	Public Awareness		
	Partnerships and Implementation	X	Emergency Management

Hazard	Terrorism
Project Name	**Terrorism Liaison**
Description	Participate in Terrorism Early Warning Group

Action Item	Appoint Terrorism Liaison Officer		
Coordinating Department	Police & Fire		
Ideas for Implementation	N/A		
Timeline/Completion Date	2004		
Total Cost	None		
Funding Source(s)	Budget – In House Employee		
Constraints	None		
Plan Goals Addressed		X	Protect Life and Property
	Public Awareness		
	Partnerships and Implementation		Emergency Management

Hazard	Terrorism		
Project Name	**Terrorism Public Awareness**		
Strategy	Provide community outreach and education to individuals and businesses concerning actions they can take in preparation for possible terrorist events.		
Action Items	1. Collect current available information and materials to soon be developed 2. Develop public awareness campaign		
Coordinating Department	**Police**, OEM, Community Relations		
Ideas for Implementation	Hire public health consultants Develop public awareness campaign		
Timeline/Completion Date	2006		
Total Cost	$5000		
Funding Source(s)	Grants		
Constraints	Time, Funding		
Plan Goals Addressed			
	Public Awareness		Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

Hazard	Terrorism
Project Name	**Cyber Terrorism Prevention**
Strategy	Upgrade Information Technology Security infrastructure and upgrade disaster recovery
Action Items	• Prioritize specifications, look for commonality with IT work plan, and implement. • Seek funding through internal grant writers • Seek direction from City management on prioritization Prevention/Detection • Configure appliance and update policies for Viruses, Web Content, and Spam • Procure intermediary switch to filter inbound web traffic

	• Enhance network monitoring, notification and escalation tools • Enhance security of VPN offering (tokens, appliance, management) • Revise base desktop security • Enhance web proxy offering • Revise registry policies • Develop, procure and implement security infrastructure for MAN sites • Enhance physical security and implement security audit recommendations • Governance of IT administrative regulations • Implement video surveillance of data center • Upgrade access control system • Review and re-engineer application and database security • Implement recommendations of network security audit • Implement emergency power at all sites • Enhance notification • Strengthen and enforce remote access policies • Strengthen remote unit (laptop) policies including, DHCP/identity management, biometrics, etc. • Develop wireless security policy for vendors / guests, and implement VPN for internal users • Develop screening / IP / NDA / privacy policies for vendors • Strengthen privacy policies • Augment resources to expand operations to 24 x 7 • Enhance Public Safety security operations Disaster Recovery • Develop secondary standby data center • Prototype data center within campus • ID and acquire skeleton hardware and software • ID manual processes that may be outside of IT domain • Revise and enhance image strategy • Provide support to EOC for IT recovery exercise • Cross training for DR operations • Implement real-time back-ups • Enhance software source control • Develop call out list • Develop worst-case shut down procedures • Enhance comprehensive DR plan • Enhance DR operational requirements • Reciprocal agreements with other agencies
Coordinating Department	Information Technology
Ideas for Implementation	Follow IT work plan and CIP preset schedule
Timeline/Completion Date	December 2007
Total Cost	$750,000

Funding Source(s)	Internal IT funds and external grants		
Constraints	Funding, resources, and Citywide priorities		
Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

FLOOD

Hazard	Flood
Project Name	**Storm Drain Systems Improvements**
Description/Strategy	Locate facilities throughout the city that will facilitate mitigation deficiencies defined in the Storm Drain System Master Plan.
Action Items	Year 1. Locate facility on Doheny Drive, between Ashcroft Ave. and Beverly Blvd. Year 3. Locate facility on Beverly Blvd. and Doheny Dr.; Arnaz Dr. between Charleville Blvd. and Gregory Way Year 5. Doheny Dr. at Beverly Blvd.; Arnaz Dr. between Wilshire Blvd. and Charleville Blvd. Arnaz Dr. South of Charleville Blvd. Gregory Way and La Cienega Blvd. Year 7. Woodland Drive. Carmelita Avenue Palm Drive Gregory Way. Year 9. North of Beverly Boulevard between Oakhurst Drive and Doheny Drive
Coordinating Department	Public Works, Engineering and Transportation
Ideas for Implementation	Prioritize projects for Capitol Improvement Program
Timeline/Completion Date	2005-2010
Total Cost	$2,410,254
Funding Source(s)	Stormwater Enterprise Fund
Constraints	Project approval Project design and construction scheduling

Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

Hazard	Flood
Project Name	**Flood Ordinance Revision**
Strategy	Update the Flood Ordinance
Action Items	Study the current flood ordinance to verify its necessity now that the County's storm drain in the area has been upgraded.
Coordinating Department	**Transportation & Engineering** – Community Development/ Building & Safety
Ideas for Implementation	1. Meet with the County to verify the new drainage capacities. 2. Based on the outcome, determine whether the ordinance should

	be amended or repealed.		
Timeline/Completion Date	2008		
Total Cost	In house staff time		
Funding Source(s)	None		
Constraints	County finishing project		
Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

EARTH MOVEMENT (LANDSLIDE AND MUDSLIDE)

Hazard: Landslide			
Project Name: **Geotechnical Investigation**			
Description: Conduct additional geotechnical investigation to update the landslide hazard maps in the City of Beverly Hills to improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.			
Action Item: Select a Geotechnical Consultant to perform the study.			
Coordinating Department: Community Development, **Engineering and Transportation**			
Timeline/Completion Date: 2007			
Total Cost: $30,000			
Funding Source(s): General Fund			
Constraints : None			
Plan Goals Addressed			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation		Emergency Management

Hazard : Landslide			
Project Name : **Hillside Development Construction**			
Description: Encourage application of designs and construction technologies for steep slopes to reduce the potential adverse impacts from development.			
Action Item: Increase communication and coordination between the city's Building and Safety, Public Works, and Engineering Departments.			
Coordinating Department: **Engineering & Transportation,** Community Development			
Timeline/Completion Date: Ongoing			
Total Cost: None			
Funding Source(s): In-house time			
Constraints: None			
Plan Goals Addressed			
	Public Awareness		Protect Life and Property
X	Partnerships and Implementation		Emergency Management

Hazard : Landslide
Project Name: **Public Outreach of Landslide**
Description: provide information to educate residents to prevent landside on hillside slopes.

Action Item: Provide handout and flyers to be distributed in City sponsored events.			
Coordinating Department: **Engineering & Transportation**, Public Works, OEM, Communication & Marketing			
Timeline/Completion Date: 2005 & ongoing			
Total Cost: Unknown at this time			
Funding Source(s): $5,000			
Constraints: None			
Plan Goals Addressed			
X	Public Awareness		Protect Life and Property
	Partnerships and Implementation		Emergency Management

WINDSTORM

Hazard	Windstorm		
Project Name	**Public Awareness Campaign**		
Strategy	Provide public education materials to City of Beverly Hills 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.		
Action Items	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 City of Beverly Hills 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 Department	**Recreation and Parks,** Communications and Marketing, OEM,		
Ideas for Implementation	None		
Timeline/Completion Date	2006 ongoing		
Total Cost	$5,000		
Funding Source(s)	Grant		
Constraints	Funding, Time		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation		Emergency Management

Hazard	Windstorm
Project Name	**Tree Pruning Program and Fire Code Sections**
Strategy	Create local City and utility awareness of tree pruning and Fire Code Sections relevant to wind-resistant utility operations.

Action Items		1. Provide information to City Planning Departments and local utility companies encouraging compliance with State and Local tree clearance and integrity guidelines by: a. Compile comprehensive list of pertinent State and local regulations b. Send letters of encouragement from Hazard Mitigation Planning Committee and local City and School officials encouraging utility compliance with guidelines		
Coordinating Department		Community Development**,** Public Works, OEM, Recreation and Parks, **Fire**, Engineering and Transportation		
Ideas for Implementation		N/A		
Timeline/Completion Date		2009		
Total Cost		$5,000		
Funding Source(s)		Grant		
Constraints		Time, Funding		
Plan Goals Addressed				
X	Public Awareness		X	Protect Life and Property
X	Partnerships and Implementation			Emergency Management

Hazard		Windstorm		
Project Name		**Equipment Testing**		
Strategy		Encourage Critical City Facilities to purchase and/or test backup power facilities for use during a power failure		
Action Items		1. Gather all databases of backup power equipment for critical facilities. 2. Test all critical facility backup power generators. 3. Keep an accurate record of equipment specification and testing date information.		
Coordinating Department		**Public Works**, Emergency Management		
Ideas for Implementation		N/A		
Timeline/Completion Date		Ongoing		
Total Cost		None		
Funding Source(s)		In House		
Constraints		N/A		
Plan Goals Addressed				
	Public Awareness			Protect Life and Property
X	Partnerships and Implementation			Emergency Management

MULTI-HAZARD

Hazard	Multi Hazard
Project Name	**Conservation Classroom**
Strategy	To educate the community about water conservation so water resources are available as demands increase and/or supply decreases
Action Items	Design an interactive conservation classroom in the Public Works Facility. Construct the classroom Publicize the classroom Educate the community using tools in the classroom.
Coordinating Department	Public Works
Ideas for Implementation	Hire a firm to design and construct incrementally the classroom as funds become available.
Timeline/Completion Date	June 30, 2007
Total Cost	$700,000
Funding Source(s)	Water Enterprise Fund Grants Private funding
Constraints	Availability of funds

Plan Goals Addressed			
X	Public Awareness		Protect Life and Property
X	Partnerships and Implementation		Emergency Management

Hazard	Multi-Hazard
Project Name	**Emergency Alert System Upgrade**
Strategy	To purchase, install and integrate additional equipment to make the necessary upgrades to the system so that the cable TV warning system will have the capability to notify all cable television subscribers with in the City.
Action Items	1. and integration of new equipment and technical systems to the existing cable TV system 2. install new digital technology
Coordinating Department	Information Technology
Ideas for Implementation	Necessity within the City's Organization.
Timeline/Completion Date	November 2004 – Design December 2004 – Equipment Purchase January 2005 – Equipment Installation and System Integration February 2005 – System Testing
Total Cost	$19,181
Funding Source(s)	State OES Grant Funding
Constraints	Lack of Funds

Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property

	Partnerships and Implementation	X	Emergency Management

Hazard	Multi-Hazard		
Project Name	**Business Community Awareness Program**		
Strategy	Provide education on Hazard Mitigation and preparedness to business community		
Action Items	Develop mitigation and preparedness program. Provide public information concerning city hazards and mitigation to the business community.		
Coordinating Department	**Office of Emergency Management**, Communications and Marketing		
Ideas for Implementation	To be developed		
Timeline/Completion Date	2007		
Total Cost	$5,000		
Funding Source(s)	Grant		
Constraints	Time, Funding		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation		Emergency Management

Hazard	Multi-Hazard		
Project Name	**Citizen Corp**		
Strategy	Expand the City's Citizen Corps Program		
Action Items	1. Expand Community Emergency Response Training (CERT), the DCS, Neighborhood Watch and Medical Reserve Corp 2. Create public awareness campaign through community outreach, press releases, City held volunteer functions 3. Create volunteer opportunities for citizens to participate		
Coordinating Department	Office of Emergency Management		
Ideas for Implementation	Map all Citizen Corps groups by home location. Pick one area and hold meeting with all members in area to encourage preparedness. Encourage local medical personnel to sign up for Los Angeles County Medical Reserve Corps.		
Timeline/Completion Date	2006		
Total Cost	Staff time		
Funding Source(s)	Unknown at this time		
Constraints	Time		
Plan Goals Addressed			
X	Public Awareness		Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

Hazard : Multi Hazard			
Project Name: **Emergency Evacuation Routes**			
Description: Identify safe evacuation routes in high-risk areas.			
Action Items: Develop evacuation plans, policies and procedures for the full range of contingencies and geographic areas of the City. Identify potential debris resources; provide information regarding emergency transportation routes.			
Coordinating Department: **Police**, Fire, Office of Emergency Management, Public Works, Engineering & Transportation			
Timeline/Completion Date: 6-months			
Total Cost: Unknown at this time			
Funding Source(s): N/A			
Constraints: None			
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

Hazard	Multi-Hazard		
Project Name	**Alley Clearance**		
Strategy	To promote the importance of maintaining private property foliage abutting alleyways in the interests of limiting fire ignition potentials while improving emergency/related service vehicle response access.		
Action Items	1. Public awareness campaign including literature and cable television public service announcements addressing property owner's responsibility in maintaining private property foliage. 2. Improve communications with utility providers concerning line clearance responsibilities and logistics.		
Coordinating Department			
Ideas for Implementation	Make brochures available at parks, libraries and city direct service line offices. Coordinate public service announcements with peak viewer periods (i.e. live feed of City Council meetings).		
Timeline/Completion Date	On going		
Total Cost	TBD		
Funding Source(s)			
Constraints	Funding, dependency on outside agencies, code enforcement		
Plan Goals Addressed			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

EVALUATION OF 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 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.

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.

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 benefit/cost analysis and cost-effectiveness analysis are important tools in evaluating whether or not to implement a mitigation activity but often a mitigation strategy is completed just because it meets the emergency management goal to protect life, property and the environment within the City.

Studying alternatives**,** calculating the costs and benefits, determining the project cost, estimating the benefits, considering costs and benefits to society and the environment are ways mitigation strategies are considered to be worthwhile.

ANALYSIS OF MITIGATION STRATEGIES AND 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.

FEMA's approaches to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist the City in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.

The following outlines several approaches for conducting an analysis of hazard mitigation projects. Information and further information on cost analysis in this section is derived in part from the Federal Emergency Management Agency Publication 331, Report on Costs and Benefits of Natural Hazard Mitigation.

Chart 11: Prioritization and Benefit Analysis of Mitigation Strategies

Hazard	Project Name	Effect on Overall Risk to Life and Property	Ease of Implementation	Political and Community Support	Funding	Overall Priority
Earthquake	**Seismic Modifications for Water System Reservoirs and Pump Stations**					
Earthquake	**Earthquake Mitigation**	Very High	Moderate	Mixed	Unfunded	Very High
Earthquake	**Safety Elemnent of the General Plan**	High	Moderate	Mixed	Funded	Very High
Earthquake	**Operations Service Center Building Mitigation**	High	Moderate	High	Funded	High
Fire	**FireWise Program**	Very High	Moderate	Mixed	Unfunded	Very High
Fire	**Wildland Interface Task Force**	Very High	Moderate	Mixed	Unfunded	Very High
Fire	**Code Update**	High	Difficult	Mixed	Unfunded	High
Fire	**Zone 9 (Closed water Pressure Zone) Hillside Fire Protection**	High	Difficult	High	Partially Funded	High
Terrorism	**Police Officer Training**	High	Easy	High	Funded	High
Terrorism	**First Responder**	Med	Easy	High	Partially Funded	High
Terrorism	**Risk Assessment**	Med	Moderate	High	Partially Funded	High
Terrorism	**Target Hardening**	Med	Moderate	High	Partially Funded	High
Terrorism	**Terrorism Liaison**	Low	Easy	High	Funded	Med

Hazard	Project Name	Effect on Overall Risk to Life and Property	Ease of Implementation	Political and Community Support	Funding	Overall Priority
Terrorism	**Terrorism Public Awareness**	Med	Easy	High	Funded	Med
Terrorism	**Cyber-Terror Prevention**	High	Moderate	Unfunded	Funded	Med
Flood	**Update Flood Ordinance**	Low	Moderate	Mixed	Unfunded	Low
Flood	**Storm Drain System Improvements**	Low	Moderate	Low	Funded	Low
Landslide	**Geotechnical Investigation**	Med	Moderate	Mixed	Funded	Med
Landslide	**Hillside Development Construction**	Med	Easy	Mixed	Unfunded	Med
Landslide	**Emergency Evacuation Routes**	High	Easy	High	Unfunded	Med
Landslide	**Public Outreach of Landslide**	Med	Easy	Mixed	Unfunded	Med
Windstorm	**Public Awareness Campaign**	Low	Easy	Low	Partially Funded	Med
Windstorm	**Tree pruning and Fire Code Sections**	Med	Difficult	Mixed	Partially Funded	High
Windstorm	**Equipment Testing**	High	Easy	Low	Funded	High
Multi-Hazard	**Conservation Classroom**	Low	Difficult	Mixed	Partially Funded	Low
Multi-Hazard	**Emergency Alert System Upgrade**	Med	Easy	Mixed	Partially Funded	Low
Multi-Hazard	**Business Community Awareness Program**	Med	Easy	High	Unfunded	Med
Multi-Hazard	**Medical Reserve Corps**	High	Moderate	Mixed	Unfunded	Med
Multi-Hazard	**Alley Clearance**	Low	Moderate	Mixed	Unfunded	Med

The two main approaches used to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

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 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. For example a cost benefit analysis was completed to assist in the decision on the Public Works Building Replacement Mitigation Project.

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 hazards can also be organized according to the perspective of those with an economic interest in the outcome.

CURRENT MITIGATION STRATEGIES
All strategies were studied using some or all of the methods. All projects or strategies were deemed to be worthwhile before they were included in this plan.

FUTURE STRATEGIES
Two of the current mitigation strategies, Firewise Program and the Earthquake Mitigation Project will create additional Hazard Mitigation strategies and projects. These will be evaluated and included in the plan maintenance. Incorporating hazard mitigation with other community projects will be encouraged.

SECTION 5
PLAN MAINTENANCE

The plan maintenance section of this document details the formal process that will ensure that the City of Beverly Hills Hazard Mitigation Plan remains an active and relevant document. This section 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 Beverly Hills 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 AND PLAN ADOPTION
The City Council will be responsible for adopting the City of Beverly Hills Hazard Mitigation Plan. This governing body has the authority to promote sound public policy regarding hazards. Once the plan has been adopted, the City's Director of Emergency Management will be responsible for submitting it to the State Hazard Mitigation Officer at The Governor's Office of Emergency Management. The Governor's Office of Emergency Management 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 Beverly Hills will gain eligibility for Hazard Mitigation Grant Program funds.
The approved Hazard Mitigation Plan will be significant in the future growth and development of the community. The Beverly Hills Hazards Mitigation Plan will go to council for approval on September 21st, 2004.

Coordinating Body
The City of Beverly Hills Hazard Mitigation Steering Committee will be responsible for coordinating implementation of the plan's strategies and undertaking the formal review process.

Continued Public Involvement
City of Beverly Hills is dedicated to involving the public directly and indirectly in the review and updates of the Hazard Mitigation Plan. The Steering 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 in appropriate departments.

A public meeting and Commission update meetings will also be held after each annual evaluation or when deemed necessary by the Hazard Mitigation Steering Committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan. The Community Safety Partnership, established by Beverly Hills City Council in 1997, concept can be used to facilitate the public process in the future.

The Community Safety Partnership was comprised of representatives from various City departments and representatives from the residential, commercial and government sectors of the City of Beverly Hills. The mission was to identify and develop plans for mitigation of all natural disaster hazards that threaten the community and provide education on mitigation measures. This committee may be reconvened to assist in the implementation of the plan. The Fire Department will convene a community based Firewise Committee to study the Fire Department's strategies. The Government and Human Relations Director and the Community Outreach Manager will assist in the coordination of future public process. Representatives could be obtained from a variety of sources including General Plan committee members, Team Beverly Hills graduates and other interested parties. The school district and the Chamber of Commerce will be included in this process.

Convener
The City Council will adopt the City of Beverly Hills Hazard Mitigation Plan, and the Hazard Mitigation Steering Committee will take responsibility for plan implementation. The Office of Emergency Management will serve as a convener to facilitate the Hazard Mitigation Steering Committee meetings. Plan implementation and evaluation will be a shared responsibility among all of the Hazard Mitigation Steering Committee Members.

IMPLEMENTATION THROUGH EXISTING PROGRAMS

City of Beverly Hills addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Projects, and City Building and Safety Codes. The 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 Beverly Hills will have the opportunity to implement recommended mitigation strategies through existing programs and procedures.

A meeting will be held every six months after the formal adoption of the mitigation plan. The meetings of the Hazard Mitigation Steering 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.

EVALUATING AND UPDATING THE PLAN AND THE FORMAL REVIEW PROCESS

The City of Beverly Hills Hazard Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in development or programs that may affect mitigation priorities. Steering Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan. The Steering committee will also be responsible for updating the plan.

The committee will review the goals and strategies 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 departments responsible for the various strategies 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 Office of Emergency Management will be designated to make appropriate changes to the Plan before submitting it to the Steering Committee members, and presenting it to the City Council. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer and the Federal Emergency Management Agency for review.

PREVIOUS MITIGATION PLANS, PROJECTS AND ACTIONS
Please see specific hazards sections for previous and existing mitigation projects.

SECTION 6

EARTHQUAKES

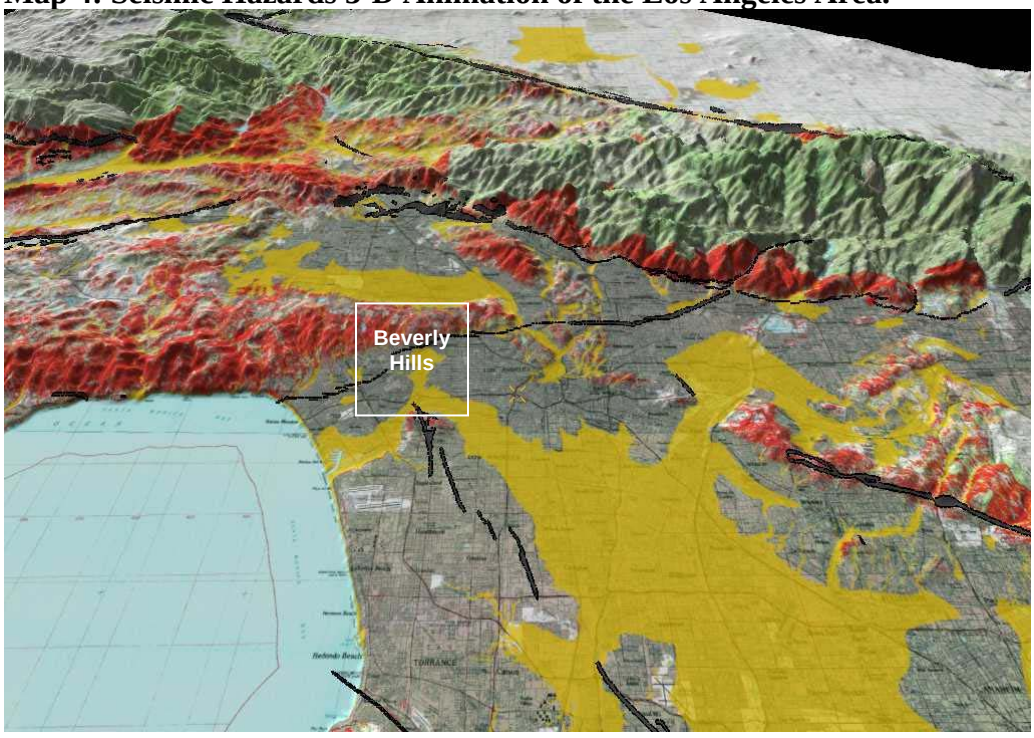
TABLE OF CONTENTS ***PAGE***

WHY ARE EARTHQUAKES A THREAT TO THE CITY OF BEVERLY HILLS?
The City of Beverly Hills is located in a region that is subject to high seismic activity. There are several active faults in or near the city. A major earthquake occurring on any one of these faults could result in substantial number of deaths and injuries and extensive damage to both public and private property. The economic impact in direct and indirect costs will be billions of dollars.

Building codes have evolved over the years and seismic design provisions have been added to or improved upon following major earthquakes. Buildings in Beverly Hills are older than that of many communities in Southern California. The result from the city's building inventory study revealed that 84% of the city's commercial buildings and 95% of the multifamily buildings were built prior to the 1976 Uniform Building Code which is used by many earthquake design professionals as a benchmark for determining buildings that may require investigation and may pose a potential threat.

In conclusion, the combination of the city's older building stock built with earlier, less stringent earthquake provisions and the city's proximity to active seismic zones makes earthquakes a major threat to the City of Beverly Hills.

Map 4: Seismic Hazards 3-D Animation of the Los Angeles Area.



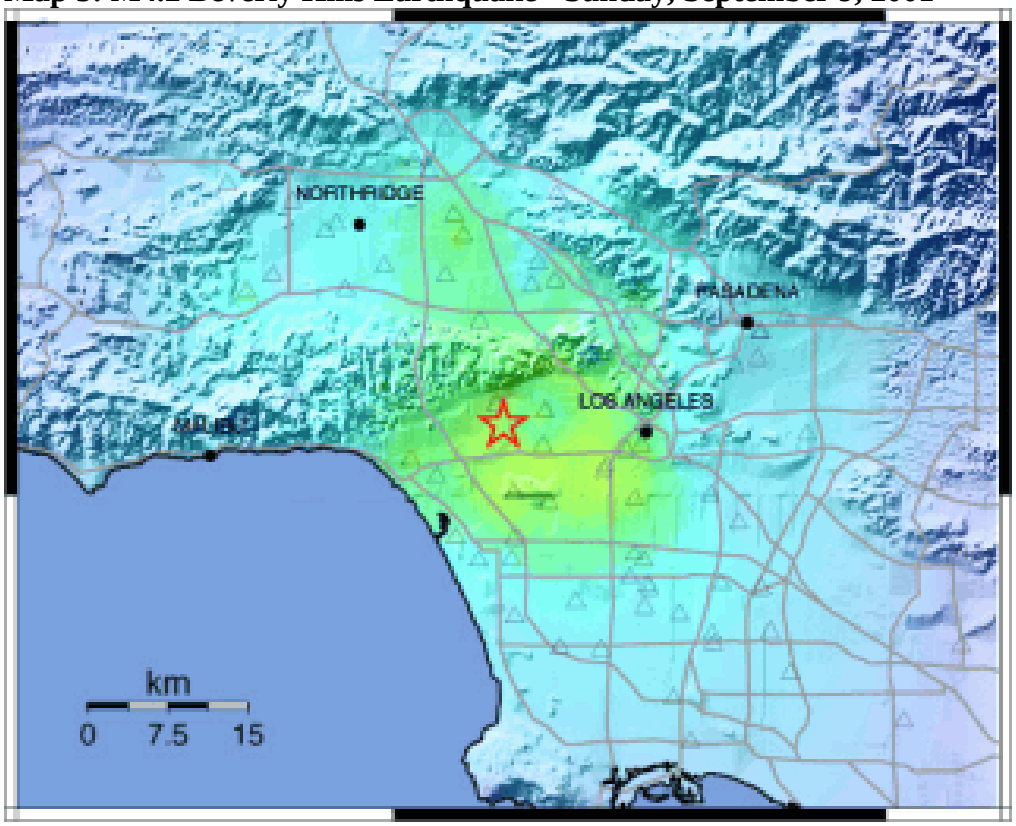
http://www.consrv.ca.gov/cgs/geologic_hazards/earthquakes/3d_snaps.htm

HISTORY OF EARTHQUAKE EVENTS IN BEVERLY HILLS
The most recent seismic activity near City of Beverly Hills was in September 9, 2001. A moderate size (M4.2) earthquake occurred in West Hollywood (see Map 5 below). This

earthquake was widely felt throughout the Los Angeles Basin and in parts of San Fernando Valley and was well recorded by the Caltech-USGS TriNet. The focal depth of this earthquake was about 4 km, making the shaking most severe in the Hollywood basin.

The earthquake was located near the intersection of the Newport-Inglewood and Hollywood faults. The focal mechanism showed horizontal strike-slip motion on a north-northwest striking plane, suggesting that this event may have been associated with the north end of the Newport- Inglewood fault. This earthquake differed from of the deep thrust faulting earthquake sequences recorded in the last two decades in the Los Angeles area such as 1987 M5.9 Whittier Narrows and 1994 M6.7 Northridge. The occurrence of this earthquake suggested activation of a shallower strike-slip regime of faults in the Los Angeles basin, which has mostly remained dormant over the last decade

Map 5: M4.2 Beverly Hills Earthquake - Sunday, September 9, 2001



Source:http://pasadena.wr.usgs.gov/eqinthenews/ci09703873/index.html

The most recent significant earthquake event in southern California that affected Beverly Hills was the 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.

Fifty-seven 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.

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 were estimated at $40 billion. Although the City of Beverly Hills is approximately 35 miles away from the epicenter of the Northridge Earthquake, several buildings in the City were red tagged and numerous block walls and chimneys were damaged. Should a similar magnitude earthquake occur in or near Beverly Hills and if it were to occur during a workday, when schools are in session, and the population of the City swells to 200,000, the number of casualties could be substantial -- up to 100's deaths and 1,000's injuries.

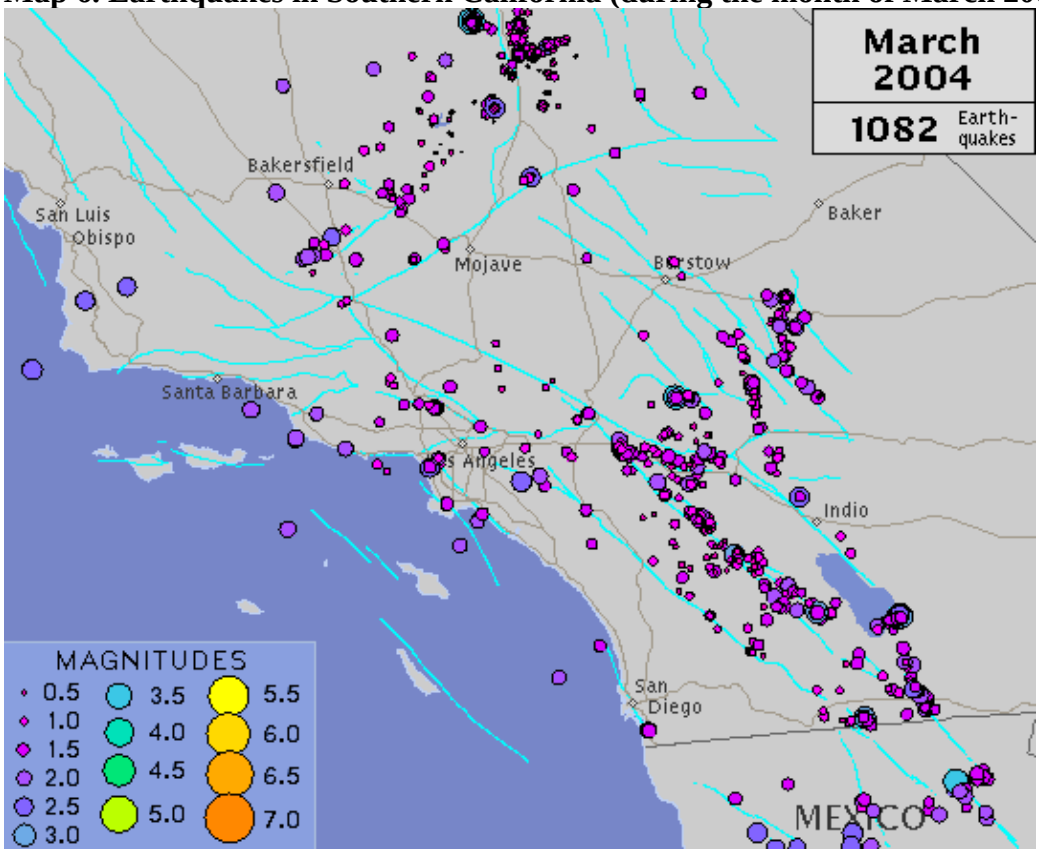
Chart 12: Significant Southern California earthquakes since 1933

Date	Time (local)	Location	Magnitude
03.10.1933	5:54 pm	Long Beach	6.4
03.25.1937	8:49 am	San Jacinto	6.0
05.18.1940	8:37 pm	Imperial Valley	6.9
10.21.1942	9:30 am	Fish Creek Mountains	6.6
03.15.1946	5:49 am	Walker Pass	6.0
04.10.1947	7:58 am	Manix	6.5
12.04.1948	3:43 pm	Desert Hot Springs	6.0
07.21.1952	3:52 am	Kern County	7.5
11.21.1952	11:46 pm	San Simeon	6.2
03.19.1954	1:54 am	Arroyo Salada	6.4
04.09.1968	6:29 pm	Borrego Mountain	6.5
02.09.1971	6:01 am	San Fernando	6.6
10.15.1979	4:54 pm	Imperial Valley	6.4
07.08.1986	2:21 am	North Palm Springs	5.9
10.01.1987	7:42 am	Whittier Narrows	5.9
11.23.1987	5:54 pm	Elmore Ranch	6.2
11.24.1987	5:15 am	Superstition Hills	6.6
04.22.1992	9:50 pm	Joshua Tree	6.1
06.28.1992	4:57 am	Landers	7.3
06.28.1992	8:05 am	Big Bear	6.3

Date	Time (local)	Location	Magnitude
01.17.1994	**4:30 am**	**Northridge**	**6.7**
10.16.1999	**2:46 am**	**Hector Mine**	**7.1**
12.22.2003	**11:15 am**	**San Simeon**	**6.5**

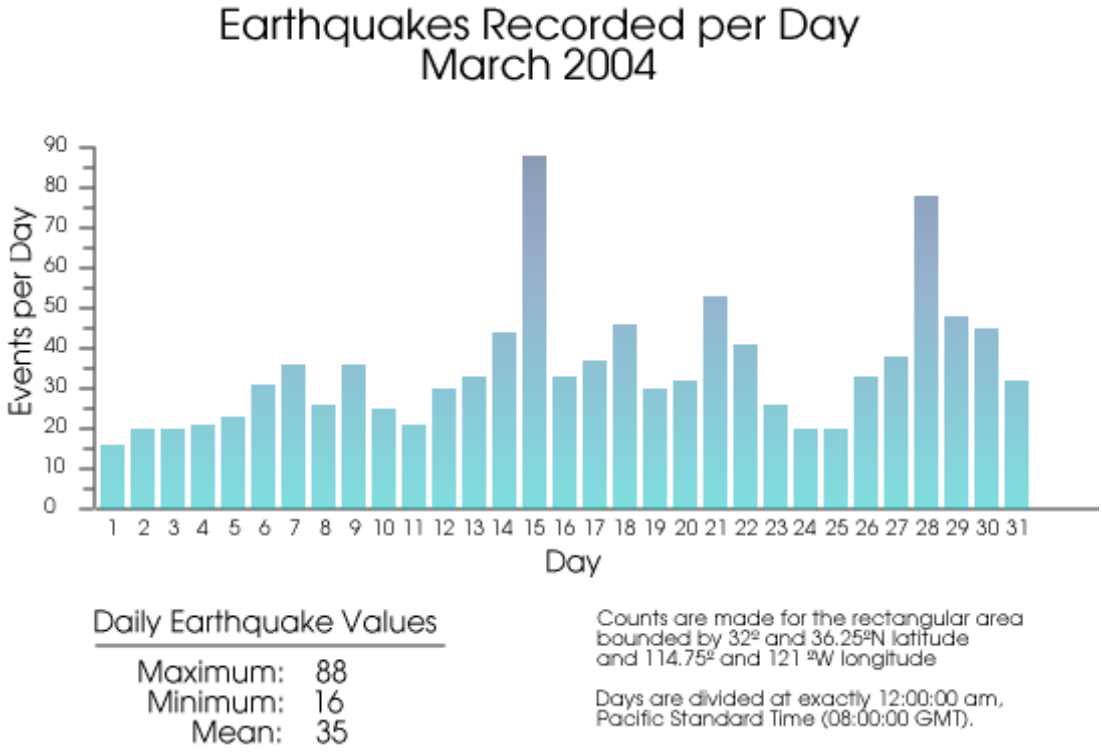
There are hundreds of earthquakes in Southern California of earthquakes every month. A few are damaging, but most are not even felt. The following Map 6 and Chart 8 show earthquakes in Southern California on a typical month (March 2004):

Map 6. Earthquakes in Southern California (during the month of March 2004)



Source: http://www.data.scec.org/Module/module.html

Chart 13: Earthquake Events in Southern California (during the month of March 2004)



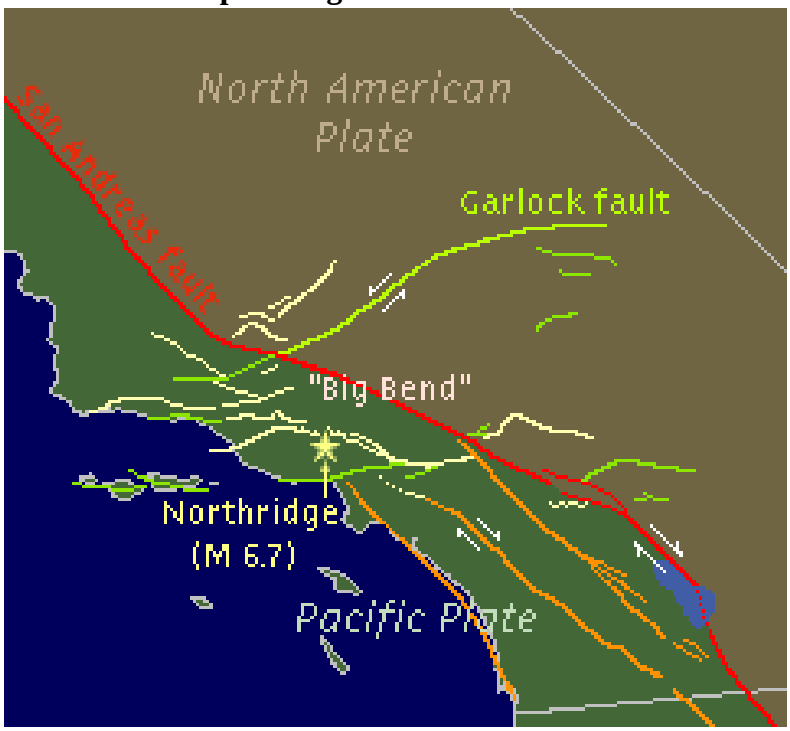
Source: http://www.data.scec.org/Module/module.html

CAUSES AND CHARACTERISTICS OF EARTHQUAKES IN SOUTHERN CALIFORNIA AND BEVERLY HILLS

The City of Beverly Hills' exposure to geologic and seismic hazards is directly related to the location of the City to active faults. Faults in Southern California can be attributed to the San Andreas fault system. This system is a major crustal discontinuity that separates the southeast-moving North American plate from the northwest- moving Pacific plate, and extends for more than 1100 kilometers along nearly the entire length of the state of California.

The "Big Bend" of the San Andreas Fault is responsible for much of the complexity of faulting in southern California. This bend is a convergent (restraining) bend, creating a localized collision of tectonic plates, and a tremendous amount of compressional stress. To release this stress, additional faults have formed over time. A typical response to large-scale compression is crustal shortening. This allows compression to continue by "squeezing" up the rocks in the compressional zone. This is accomplished by thrust faults -- low-angle reverse faults that drive sections of crust over one another to create a thicker pile of crust with a shorter (horizontal) length. The surface traces of such faults are shown in pale yellow on the map view below. The 1994 Northridge earthquake (magnitude 6.7) occurred on one of these numerous thrust faults.

Map 7: “Big Bend” of the San Andreas Fault



Not all the compressional force generated by the "Big Bend" of the San Andreas Fault goes into thrust faults. The collision boundary is not square with the plate motion, but at an angle, in such a way that some of the material "caught in the middle" has a chance to move laterally out of the way. This is exactly what happens. Large zones of left- lateral faulting, shown here in green, have formed in an effort to relieve some of the stress created by the fault bend. An example of this left-lateral faulting is the Hollywood / Santa Monica fault zone and the Garlock fault which intersects with the San Andreas near the northern end of the "Big Bend" and continues eastward for several hundred kilometers.

In addition, several right- lateral strike-slip faults south of the Big Bend, and west of the southern San Andreas Fault zone, seem to be managing some of the overall slip between the two tectonic plates. These fault zones, shown here in orange, are quite lengthy and roughly parallel the plate boundary.

But San Andreas is only one of dozens of known earthquake faults that crisscross Southern California. Some of the better known faults include the Newport-Inglewood, Santa Monica, Hollywood, Puente Hills, Whittier, Chatsworth, Elsinore, 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.

One set of clues that you may have considered using to see through the apparent problems with the activity above is the topography of the Los Angeles basin -- the mountains, hills, and valleys present in the area. Low-angle faults (including some blind faults) can alter the surface, creating plateaus and hills by gradually uplifting a region. When such an uplifted area can be found prominently on one side of a fault, while the other side is low- lying and basically flat, there is a fair probability that the fault has a non-vertical dip, and so epicenters positioned off the fault trace are quite possible. Also, a belt of hills with no associated fault trace is an excellent signal that there may be a blind fault at work beneath those hills.

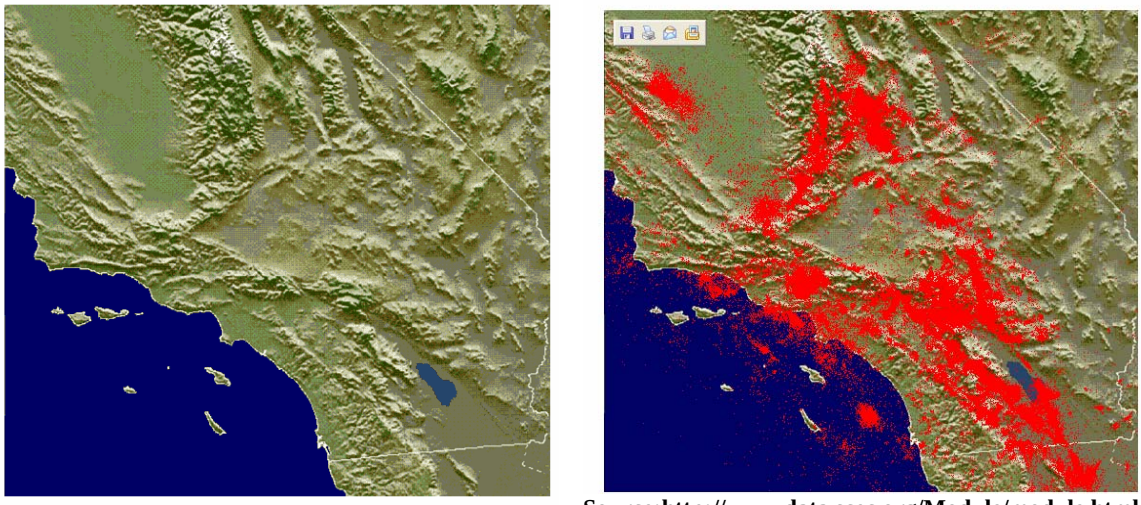
TOPOGRAPHY

The Santa Monica Mountains, located in the northern portion of the City, are in the Transverse Ranges Physiographic province. The coastal plain of the Los Angeles Basin, located in the southern portion of the City, is part of the peninsular Ranges Physiographic Province. The majority of the City lies in a transitional area between the mountains and the coastal plain. This transitional area consists of broad coalescing alluvial fans that have developed over geologic time from debris that have been eroded from the Santa Monica mountains.

The presence of these three distinct physiographic features (the mountains, the alluvial fans, and the Los Angeles coastal plain) within the City provides considerable topographic relief. The lowest point within the city is 120 feet above sea level at Olympic Blvd and La Cienega Blvd and the highest point is 1400 feet above sea level along Carla Ridge Dr in Trousdale Estates area.

Areas north of Sunset Blvd are characterized by the typical rugged topography of the Santa Monica Mountains with steep sided ridges and narrow ravines or valleys. Between Sunset Boulevard and Santa Monica Boulevard, the surface of the alluvial fans slopes about 2 to 3 percent in a south southeast direction. South of Santa Monica Boulevard the terrain flattens as the alluvial fans merge into the coastal plain.

Map 8: Topography of the Los Angeles Basin (The red dots represent earthquake occurrences from 1932 – 1996).



Source:http://www.data.scec.org/Module/module.html

The City of Beverly Hills is located along the boundary between the Transverse Ranges and Peninsular Ranges physiographic of southern California as shown in Map 4. The Transverse Ranges consist of a complex series of elongate, east-west trending mountains, such as the Santa Monica Mountains, and intervening valleys. In contrast, the Peninsular Ranges province consists of northwest-southwest trending mountains, such as the Santa Ana Mountains, and intervening valleys. Both the Transverse Ranges and Peninsular Ranges physiographic provinces are seismically active and contain many active faults.

Local Soil Conditions
The areas north of Sunset Boulevard in the Santa Monica Mountains are underlain primarily by Triassic metamorphic, Jurassic granitic, and upper Miocene sedimentary rocks. The alluvial fans that underlie most of the City south of Sunset Boulevard consist of Quaternary debris generated from erosion of the Santa Monica Mountains.

Certain soils greatly amplify the shaking in an earthquake. Passing from rock to soil, seismic waves slow down but get bigger. Hence a soft, loose soil may shake more intensely than hard rock at the same distance from the same earthquake.

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

EARTHQUAKE FAULTS IN OR NEAR BEVERLY HILLS
Numerous active earthquake faults present a potential danger to the City of Beverly Hills. Of these, those that probably present the most danger are as follows:

THE NEWPORT/INGLEWOOD FAULT
This fault extends to just south of the City and is capable of producing a 6.9 magnitude earthquake. It has a slip rate at 1mm/yr. Because of its proximity to the City, it is thought to present a greater danger to the City in terms of death and destruction than the San Andreas.

The Newport-Inglewood is a right- lateral fault system. The movement on this fault caused the 1933 Long Beach magnitude 6.3 earthquake, and the 1920 Inglewood earthquake (estimated magnitude 4.9).

The 1933 earthquake resulted in 120 deaths and over $50 million in property damage. Most of the damaged buildings were of unreinforced masonry. Many school buildings were destroyed.

THE SANTA MONICA FAULT
This fault actually runs through the northern part of the City and with a slip rate of 1 mm/yr, it is capable of producing a 6.6 magnitude earthquake. Thus, like the Newport/Inglewood Fault, the Santa Monica Fault is also thought to present a great danger to the City.

The Santa Monica Fault is a part of a major east-west trending, northward dipping, left lateral-reverse fault system that forms the southern boundary of the Transverse Ranges physiographic province. This system of faults is located along the southern front of the Santa Monica mountains and extends from offshore in Santa Monica Bay to the San Gabriel mountains. Other faults that appear to be a part of this system are the Anacapa (Dume) fault, Malibu Coast fault, Raymond fault (located to the east of the City in Pasadena area).

THE HOLLYWOOD FAULT
This fault is located near the base of the Santa Monica Mountains. The fault dips steeply to the north beneath the Santa Monica Mountains. Movement on the fault has juxtaposed the granitic, metamorphic, and sedimentary rocks of the Santa Monica Mountains up and over the sedimentary deposits south of the mountains. This fault actually runs through the northern part of the City and with a slip rate of 1 mm/yr, it is capable of producing a 6.4 magnitude earthquake. Thus, like the Newport/Inglewood Fault, the Hollywood Fault is also thought to present a great danger to the City. The Hollywood Fault is also a part of a major east-west trending, northward dipping, left lateral-reverse fault system that forms the southern boundary of the Transverse Ranges physiographic province. Other faults that appear to be a part of this system are the Anacapa (Dume) fault, Malibu Coast fault, Raymond fault (located to the east of the City in Pasadena area).

THE PUENTE HILLS FAULT
This fault system runs under downtown Los Angeles could generate an earthquake of magnitude 7.0 or greater. The fault snakes underground for at least 25 miles, form Puente Hills in northern Orange County through downtown Los Angeles and west toward Beverly Hills.

THE SIERRA MADRE/SAN FERNANDO FAULT SYSTEM
This fault system includes the Cucamonga, Sierra Madre, San Fernando and Santa Susana faults. Of this system of faults, the San Fernando Fault is most likely to present a danger to the City of Beverly Hills. Located approximately fourteen (14) miles to the north of City of Beverly Hills, this fault, caused great destruction and numerous deaths and injuries in 1971. With a slip rate of 3 mm/yr, this fault is capable of producing a 7.0 magnitude earthquake with a.

THE WHITTIER FAULT
Located approximately twenty-three (23) miles to the southeast, this fault is capable of a 7.0 magnitude earthquake. During the Whittier Narrows earthquake of October 1987, which registered a magnitude of only 5.9, several buildings in Beverly Hills sustained damage, including one of the City's parking structures.

THE SAN ANDREAS FAULT
Undoubtedly the most well known fault in California, the San Andreas Fault is located approximately nearly forty (40) miles to the east and with a slip rate of 24 mm/yr, it is capable of an 8.5 magnitude earthquake. Although capable of causing major damage throughout the Los Angeles Basin, it is now thought by many experts that because of its distance from Metropolitan Los Angeles (including Beverly Hills), it probably presents less danger to the City than some of the other faults mentioned above.

RAYMOND FAULT
Located near San Marino and South Pasadena, with a slip rate of 0.5 mm/yr, this fault is capable of producing a 6.5 magnitude earthquake. The exact nature of the slip along the Raymond fault has been a subject of debate for quite some time. The fault produces a

very obvious south- facing scarp along much of its length, and this has made many favor reverse-slip as the predominant sense of fault motion. However, there are also places along this scarp where left-lateral stream offsets of several hundred meters can be seen.

The matter will not be conclusively resolved until the Raymond fault ruptures at the surface, but some new light was shed on the debate in late 1988, when the Pasadena Earthquake occurred.

Apparently located on the Raymond fault, the motion of this quake was predominantly left-lateral, with a reverse component only about 1/15th the size of the lateral component. Curiously enough, this corresponds very well with a scarp height of about 30 meters (reverse slip) versus a left- lateral stream offset of about 400 meters (lateral slip), which are found along the scarp of the Raymond fault south of Pasadena. If the Raymond fault is indeed primarily a left- lateral fault, it could be responsible for transferring slip southward from the Sierra Madre fault zone to other fault systems.

EARTHQUAKE RELATED HAZARDS IN BEVERLY HILLS

Amount of damage to a building does not depend solely on how hard it is shaken. In general, smaller buildings such as houses are damaged more by higher frequencies, so usually a house must be relatively close to the hypocenter to be severely damaged. Larger structures such as high-rises are damaged more by lower frequencies and will be more noticeably affected by the largest earthquakes, even at considerable distances.

In addition to regional aspects of the earthquake hazard, there are location-specific hazards that can cause additional damage: surface rupture, ground shaking, amplification, settlement, liquefaction, and landslides. State laws require that every person buying a home or real property in California to be told if the property is in on one of these zones.

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. The City of Beverly Hills has a high likelihood of encountering such risks, especially in areas with steep slopes. See earth movement (Landslide) section for more information.

Earthquake Induced 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

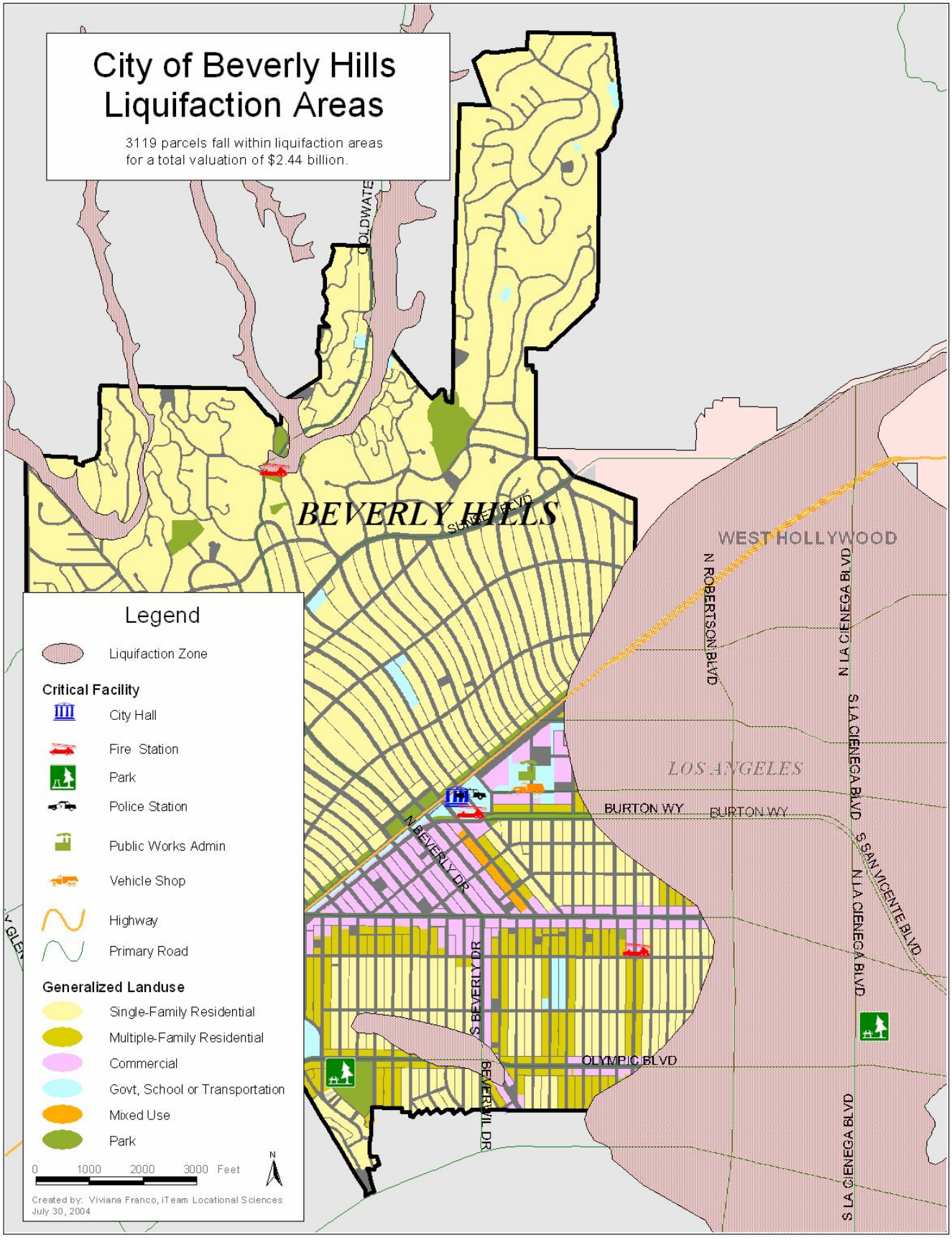
support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures.

Liquefaction- induced ground failure has historically been a major cause of earthquake damage in Southern California. During the 1971 San Fernando and 1994 Northridge earthquakes, significant damage to roads, utility pipelines, buildings, and other structures in the Los Angeles area was caused by liquefaction-induced ground displacement. Localities most susceptible to liquefaction-induced damage are underlain by loose, water saturated granular sediments at depths less than 40 feet subsurface. These geological and groundwater conditions exist in the City of Beverly Hills.

Liquefaction Zone

Some areas of the city have a high water table. Where this condition occurs, it is possible for the ground to liquefy during an earthquake, becoming like quicksand. If this occurs, buildings may settle or tilt. Such damage occurred in the Marina District in San Francisco in the 1989 Loma Prietta earthquake. The potential for liquefaction is considered for all new construction in the city. In Beverly Hills, there are about 1000 buildings that are within the Liquefaction Zone – (See Map 9 below).

Map 9: Liquefaction Zones



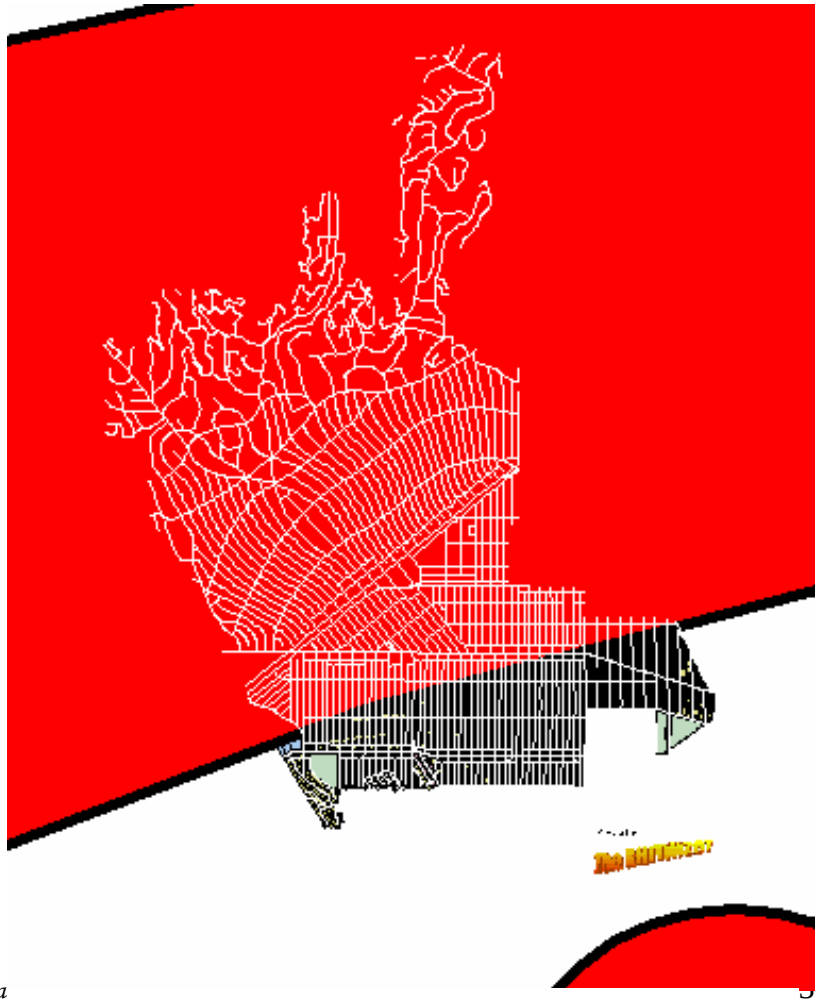
Amplification
Soils and soft sedimentary rocks near the earth's surface can modify ground shaking caused by earthquakes. One of these modifications is amplification. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. Buildings and structures built on soft and unconsolidated soils can face greater risk **(13)**. Amplification can also occur in areas with deep sediment filled basins and on ridge tops.

Settlements
Dissipation of seismically induced port water pressure in saturated granular soils may lead to settlements after the shaking has stopped. The areas most susceptible to this potential hazard are the same areas that are in the liquefaction zone. Earthquake induced settlements can also occur in dry or moist granular materials simply as a result of shaking without pore water pressure buildup.

HAZARD IDENTIFICATION

Southern California earthquakes have been identified by several sources including the Steering Committee, the Project Coordinators and the Office of Emergency Management to be the most likely disaster to occur within the City of Beverly Hills.

Map 10: Known earthquake fault near Source Zones in City of Beverly Hills



This map shows the known earthquake fault near Source Zones in City of Beverly Hills. Red area is earthquake fault near source zone per UBC Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada – 1997.

RISK ANALYSIS

Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time **(16)**. 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 (17). The HAZUS software is available in the Information Technology Department but has not been run in the last years.

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 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 Beverly Hills has 121 unreinforced masonry buildings. All have been retrofitted.

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.

PEAK GROUND ACCERLERATION IN BEVERLY HILLS

The peak acceleration is the maximum acceleration experienced by the particle attached to the earth during the course of the earthquake motion. This movement can be described by its changing position, velocity as a function of time, or by its changing acceleration as a function of time.

Although predicting an earthquake is not possible, By using Federal Emergency Management Agencies methodology (FEMA 386-2), peak ground acceleration and average return period can be identified. These results were used to approximate the amount of damage.

The calculated maximum peak ground acceleration is 0.45g within the City of Beverly Hills for a 10 percent probability of being exceeded in 50 years (which corresponds to an average return period of about 475 years)

For PGA of 0.45g, earthquake loss estimation tables provide a simplified indication of the damages to different kinds of buildings (FEMA 386-2).

- 20 - 27% of wood frame single family homes would be lost for 120 - 200 days
- 19 – 22% of wood frame apartment building would be lost for 130 – 220 days
- 20 – 27% of steel frame office buildings would be lost.
- 27 – 35% of reinforced masonry buildings would be lost for 65-90 days

The calculated maximum peak ground acceleration is 0.2g within the City of Beverly Hills of a 50 percent probability of being exceeded in 50 years (which corresponds to an average return period of about 72 years).

For PGA or 0.2g, earthquake loss estimation tables provide a simplified indication of the damages to different kinds of buildings (FEMA 386-2)

- Approximately 3% of wood frame single family homes would be lost for 9 – 15 days.
- Approximately 3% of wood frame apartment building would be lost for 10 – 16 days.
- 3 - 5% of steel frame office buildings would be lost.
- 6 - 8% of reinforced masonry buildings would be lost for 10 – 20 days.

Source: FEMA 386-2 – Understanding Your Risks identifying hazards and estimating losses.

WHAT IS SUSCEPTIABLE TO EARTHQUAKES?

Collapse or damage to residential and commercial buildings, schools, and lifelines due to an earthquake will result in loss of life and injury. Results from our consultant's report states that 743 of the city's 885 buildings (84%) and 1480 of the city's 1565 multifamily buildings (95%) were constructed prior to the 1976 code provisions . The consultant goes on to say that the damage or collapse of the 1565 multifamily buildings will mean approximately 10,000 dwelling units may become uninhabitable. Post-disaster services for care and temporary housing will be significant.

Buildings

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk and the cost to clean up the damages is great. City of Beverly Hills has many buildings that were built before the adoption of the 1976 UBC 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.

Infrastructure and Communication

Residents in the City of Beverly Hills 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,

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. Disruption to transportation makes it especially difficult to bring in supplies or services. Lifelines need to be usable after earthquake to allow for rescue, recovery, and rebuilding efforts and to relay important information to the public.

Disruption of Critical Services
Critical facilities include the police station, the fire stations, City Hall and other facilities that provide important services to the community. These facilities and their services need to be functional after an earthquake event.

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 **(18)**.

INDIVIDUAL PREPARDENESS
Because the potential for earthquake occurrences and earthquake related property damage is relatively high in the City of Beverly Hills, 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. This is the biggest concern in the city's high fire hazard zone.

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. The city has an agreement with the old debris management company. By 2005 the city will have a new plan with a new commercial contractor to ensure debris removal after a disaster.

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.

RSVP- A public awareness brochure was created to educate citizens on to mitigate various natural or man- made hazards all together. The City of Beverly Hills has taken the following steps in its movement to upgrade structural facilities. For instance the Public Works department is in the process of retrofitting the steel in the reservoir tanks throughout the city. Completion date is to be determined.

CODE DEVELOPMENT

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. **(14)**.

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides **(15)**. 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

City of Beverly Hills' Codes
Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Beverly Hills Community Development Department Building and Safety enforces building codes pertaining to earthquake hazards.

The City of Beverly Hills Building Code sets the minimum design and construction standards for construction. In September 2002, the City of Beverly Hills adopted the most recent California Building Code. Additionally, the following is list of seismic related amendments in the City of Beverly Hills:

Chart 14: Seismic Building Codes

Section	Title
1612.3.1	Basic Load combinations
1612.3.2	Alternate Basic Load combinations
1629.4.2	Near-source factor – Steel
1630.1.1	Earthquake Loads; light-frame walls
1630.4.2	Redundancy factor
1630.7	Horizontal Torsional Moments
1630.8.2.1	Elements supporting discontinued system
1630.8.2.2	Detailing requirements for Steel
1630.10.2	Story Drift
1633.2.9	Diaphragms supporting concrete or masonry walls and diaphragm chords and drag members
1701.5	Special inspection for structural welding
1702	Structural Observation
1806.6.1	Additional requirements regarding steel plate washer for anchor bolts
Division IV and V of Chapter 22	Seismic Provisions for Structural Steel buildings

- In 1989, in accordance with Senate Bill 547, buildings were surveyed and identified buildings thought to be unreinforced masonry. With the number of such buildings and the extend and severity of the risk, the city developed a mitigation program – Resolution (No. 89-R-7896) mandatory retrofit program. 121 potentially hazardous buildings were identified and have been retrofitted.

- In 1986, the City contacted with the geotechnical consulting firm of Woodward-Clyde to prepare a geotechnical report on the City's seismic hazards in order to update the Seismic Element of the City's General Plan. .

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 1 below provides a sampling of some of the 200 plus laws in the State's codes.

Chart 15: Partial List of California Building 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 central 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.
Source: http://www.leginfo.ca.gov/calaw.html	

EARTHQUAKE MITIGATION STRATEGIES

The following, Attachment I, are excerpts from Melvyn Green and Associates report on Structural Assessment of Commercial and Multi-Family Residential Structures – Report II – Policy Considerations. This report will be evaluated as one of the mitigation strategies in Earthquake hazards.

Attachment I. Melvyn Green and Associates Report

III. What Is at Risk?

The consequences of doing nothing about the potential earthquake risks are significant. There are impacts across the community.

Building Owners and Tenants

For building owners who choose to do nothing there is the risk of:

- Life loss and injury
- Building Damage
- Business disruption, including possibility that tenants and occupants may leave and the public may be reluctant to continue to use the building
- Loss of insurance coverage
- Increased Liability
- Loss of Income
- Decreased competitiveness in leasing space

For tenants and occupants there is the risk of:

- Life loss and injury
- Business losses
- Potential damage to equipment, inventory, supplies and leasehold improvements.
- Loss of housing including disruption and relocation, changes in living style

City of Beverly Hills

For Beverly Hills, the city should consider several factors in establishing the policies for building seismic safety. The following section summarizes the issues.

Life safety and injuries

Commercial Structures - Based on the experience of past California earthquakes, death and injury can occur in the building types described above. Deaths occurred in the Olive View Hospital, a concrete building, in the 1971 earthquake. The sixteen deaths in the Northridge Meadows apartment building illustrate the soft-story risk. Unreinforced masonry building risk has been significantly reduced as a result of the retrofit program of the city, but historically this building type caused many deaths.

Had the Northridge earthquake occurred during an hour when large commercial buildings were occupied, many more deaths would have occurred. Some concrete frame buildings in Beverly Hills sustained major damage resulting in the near collapse of the structure. In Los Angeles the collapse of a story occurred in several buildings in the San Fernando Valley.

An accurate estimate of the number of occupants of commercial buildings is difficult to derive. Official figures for the occupant loads of buildings exist, but these are fire safety numbers. They are purposely estimated very high. The number of people present in the City of Beverly Hills varies by hour, day of the week, and season. Taking approximately one-third of the official fire safety occupant load would give an estimated daytime population of about thirty to forty thousand people.

Multifamily Residential Structures - Residential occupants are easier to enumerate. At an average occupancy of 1.9 persons per dwelling unit, the city has approximately 18,000 residents of multifamily structures..

City Services

Commercial Structures - Commercial losses will place a major demand on city services. Search and rescue in major buildings could be necessary. In an earthquake, many homes and businesses could be lost. Recovery may take years and change the character of the commercial core of the city. Loss of a significant number of buildings in the city would have a pronounced effect on the tax base, sales tax income and the whole character of the city.

Multifamily Residential Structures - The demand for post-disaster city services can be significant. The loss of 10,000 dwelling units is possible. Using the residential occupant load described above, such a loss would result in 20,000 persons requiring care and housing, a monumental task. Many of the city's rent-controlled structures would be lost.

Mitigation will reduce the cost to the city, owners and occupants, and will reduce recovery time for the entire community.

Economic Risk

The city's building stock has a high assessed valuation. In addition to direct loss, occupancy-specific indirect losses can be anticipated. Business interruption, not usually discussed in damage reports, may have been the largest loss of the Northridge earthquake.

Safety services and administrative costs associated with closing structures could be considerable, depending on owner cooperation. The city will also incur costs for the cleanup of public property. Some of the clean-up costs

will be reimbursable but there are always some expenses incurred by the community.

Commercial Structures

The year 2001-2002 valuation of the commercial stock of pre 1976 code buildings is approximately $2,250,000,000 and the assessed value of the post 1976 code buildings is $609,000,000. This does not include the assessed land value of about $2.2 billion. In a major earthquake, one with a long duration of ground shaking, it is estimated that there could be a loss of over four hundred of the commercial buildings. Assuming that not all buildings are destroyed, the real building loss could be in the $2,000,000,000 range.

In addition, less-affected buildings in areas of substantial damage will lose value because of the loss of neighborhood value. This is particularly true in commercial areas, where individual properties derive part of their value from location in a thriving district offering a variety of opportunities for shoppers. Loss of buildings or businesses in such a district could adversely affect the commercial viability of the entire neighborhood for an extended period.

When a commercial structure is destroyed, the city loses much of the property tax on that parcel for a significant period, until something else is constructed as a replacement.

Further, there is the loss of sales tax generated by that commercial occupancy. This may not ever be regained, for example, if a professional office structure is constructed to replace the retail structure previously on the site.

If a number of these structures in the same neighborhood are lost, the income of the surviving merchants, and their tax contributions, will also decrease because the shopping traffic in the area will be reduced. It should be expected that some businesses will fail as a result, even if the buildings in which they are located are not seriously damaged.

Partial losses, where buildings can be repaired, may result in greater or less loss of sales tax revenue. If partial building failures are widespread, long term damage may be done to the commercial viability of individual merchants or of the district as a whole.

Multifamily Residential Structures

Multifamily residential construction has a total valuation of almost $1,000,000,000. Improvements are $371,000,000 of this amount. About 70% of the multifamily residential structures are considered to be potentially at risk. Assuming that not all buildings would be destroyed, a building loss approaching $500,000,000 is not unlikely.

Permanent loss of these structures would cause temporary loss of property tax revenue until a new structure is constructed. This could even out over time, because the new structure might generate more property tax revenue than the old. There would be an issue concerning what might be reconstructed on the site, perhaps in a downzoned area, creating a number of appeals and ultimately the loss of housing units.

Temporary or permanent loss of multi-family residential buildings would cause a short term crisis for the city, as people would require assistance to find shelter and might need considerable assistance of all kinds from the city. If residents went elsewhere, this might affect the commercial sector strongly in the short run and to some extent for a longer period of time.

The loss of rent-controlled housing units might result in the displacement of tenants with no place to go.

It is probable that any reconstructed housing would be in larger buildings than the typical two story buildings now in the older neighborhoods.

Background - The nature of seismic risk to buildings is a well-analyzed subject. With each earthquake, experience is assimilated into the building code, resulting in increasingly sophisticated design for seismic safety over time.

Buildings of earlier construction may have been constructed in such a way that they present little practical risk to occupants. On the other hand, they may have significant design deficiencies. Where such deficiencies exist, they can generally be corrected to an acceptable level of risk.

Risk associated with older structures can be divided into specific types of risk:

Risk associated with materials – For example, risk associated with unreinforced masonry was identified in the 1933 Long Beach Earthquake. Buildings constructed since that time have an increasing level of steel reinforcing to compensate for the tensile weakness of masonry.

Risk associated with specific details- For example, some details, such as "soft story" construction, or "cripple stud" construction, described below, are associated with specific failure scenarios that have occurred in past earthquakes.

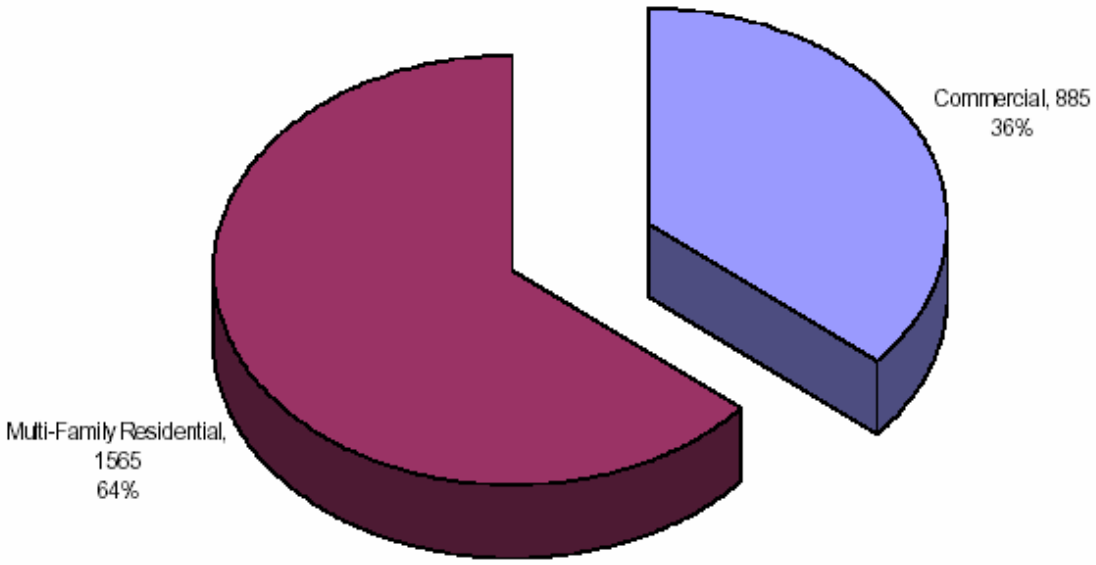
Each structural code change that was precipitated by failures in previous earthquakes has a benchmark code year, meaning the year in which the provisions of the Code changes were applied to new buildings. For example, in Beverly Hills, the critical elements of the 1976 Code were adopted in 1981, therefore the study looked for structures construction prior to 1981 when evaluating the weaknesses addressed by the 1976 Code. See the Appendix for a comprehensive list of Code changes and years in which these Codes were adopted.

General – Most of the city's commercial and multifamily residential building stock is over 35 years of age. The building stock is quite diverse in size, height and type of construction. The study used an occupancy assumption of 1.9 for multi-family residential dwelling units, based on the latest census data. Commercial use occupancy is based on the building code date with a reduction factor based on the fact that not all structures are occupied to full capacity at all times

Mix of Buildings – The building stock consists of about 885 commercial structures and 2,191 multifamily residential structures.

Many of the multi-family structures had detached garages. Disregarding the 626 garage structures, there are 1,565 multi-family residential buildings.

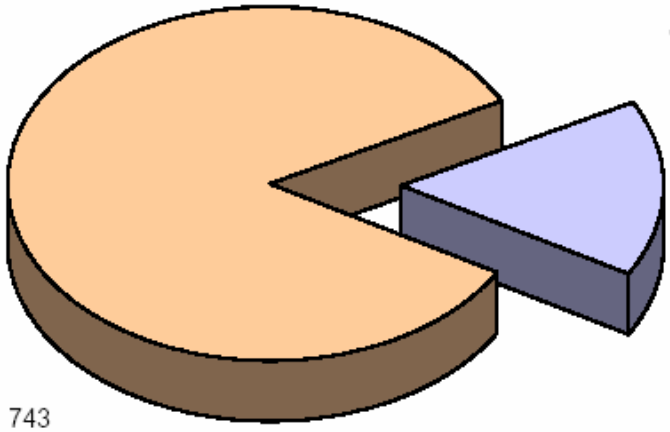
Percentage of Commercial vs. Multifamily Residential



Age of Buildings – Most of the buildings in the study were constructed prior to the adoption in 1981 of the 1976 Uniform Building Code. The 1976 edition of the building code is an important benchmark as it incorporated detailed new provisions for concrete, steel, masonry and wood buildings based on the experience of the 1971 San Fernando earthquake.

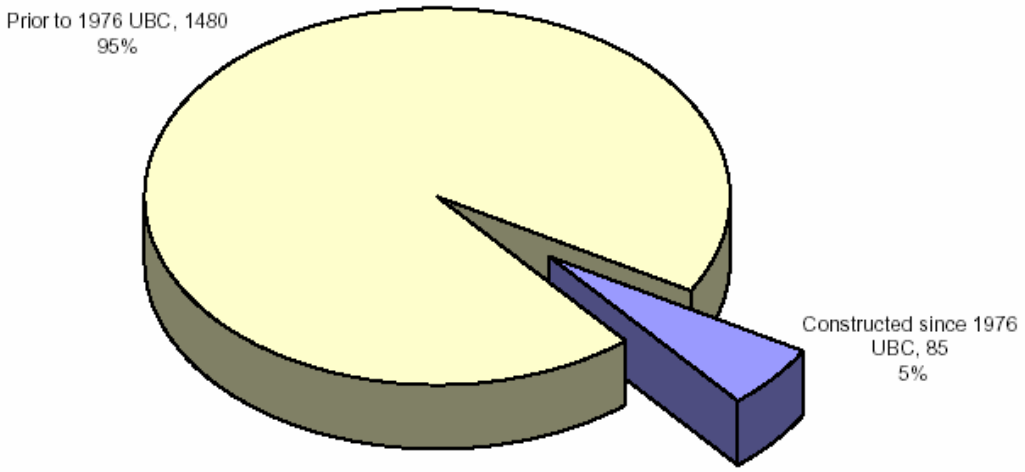
About 84% of the commercial buildings were constructed before the adoption of the 1976 code provisions in 1981.

Percentage of Commercial Buildings Constructed before Application of 1976 UBC



Approximately 95% of the multifamily residential buildings were constructed prior to the adoption of the 1976 provisions in 1981.

Percentage of Residential Buildings Constructed before Application of 1976 UBC



Type of Construction--Buildings of all types of construction were considered in this study including structures of wood , frame and soft story construction, masonry structures, steel and concrete frame buildings. The findings were:

Unreinforced Masonry Structures

The City Council adopted a mandatory retrofit program in 1989. Ninety buildings were identified. All have been strengthened.

Wood frame Buildings

Many early wood frame structures are not connected to their foundations with anchor bolts. This permits the building to slide off the foundation.

Wood frame structures may be constructed on short wood studs between the first floor and the foundation. This construction is referred to as cripple studs or cripple stud walls. This type of construction may collapse and topple, dropping the building to the ground.

There are over 1,000 buildings with either of these potential deficiencies, some with both conditions. Approximately 6,500 dwelling units, housing over 12,000 residents, are potentially at risk.

Wood frame building with Soft Story and/or Tuck-under Parking

Many multifamily residential buildings have a parking level entered from the front or from the alley in the rear. The building above the parking area is supported on small round or square columns. Before the 1976 provisions were adopted in 1981, the code did not control the amount of movement of these support columns. Excessive movement of the columns of such buildings may result in collapse of the garage under earthquake shaking. Injury, life loss, and partial or complete building collapse are possible. Damage of this type resulted in deaths at the Northridge Meadows apartment building in the 1994 earthquake.

The survey found about 450 buildings with this weakness. These buildings contain 2,315 dwelling units, housing about 4,400 residents.

Concrete Buildings

Two types of pre-1976 building code concrete buildings pose potential risks.

The first type is the non-ductile concrete frame.

In earthquake design, a structural system is said to be "ductile" if it can go through the side to side movement of earthquakes without significant damage. Ductility in a concrete structure is provided by amount and placement of reinforcing steel, and by proper detailing of connections. If a building is not ductile, as is true of many concrete frame buildings constructed before the 1976 Uniform Building Code, an earthquake may cause partial or total collapse. This was observed in structures along Wilshire Blvd as well as in the San Fernando Valley in the 1994 earthquake. Buildings of this type may "pancake" as observed in the Mexico City earthquake in 1985. In the Mexico City earthquake thousands of deaths resulted from failure of such building types.

A second potential problem with some concrete buildings is a "soft" first story. These structures have a ground floor that is substantially more open than the upper stories and has fewer structural elements on the ground floor that can resist lateral (sideways) movement. This type of design is common in hotel, office and hospital architecture, where the first floor often consists of an open lobby. Buildings of this kind may collapse in a manner similar to that of the Olive View Hospital in the 1971 San Fernando Earthquake and the Imperial County Services Building in the Imperial Valley Earthquake of 1979.

About 134 concrete buildings three or more stories in height constructed with "soft" first stories and/or with non-ductile frames were identified in the survey. Of these, 48 were multi-family residential; these contain almost 1,100 dwelling units. The commercial stock included 75 buildings. One and two story buildings, while still a potential risk, may not pose the same degree of risk as the high-rise buildings.

Structural Steel Buildings

All steel buildings may face some earthquake problems. Even the newer steel buildings constructed after the 1976 building code had problems in the 1994 earthquake. These problems involved the failure of welds between beams and columns at connections. Such failures are expected to be local, a portion of a floor collapsing, rather than loss of the entire building. There are estimated to be about 40 structures of this type in Beverly Hills. Los Angeles established a testing and inspection program for this building type.

Reinforced Masonry Wall and Concrete Tilt-up Wall Buildings

In past earthquakes, walls of masonry and tilt-up buildings have pulled away from the wall and roof and collapsed. A significant number of these failures in tilt-up buildings occurred in the 1994 earthquake in areas of the San Fernando Valley. As a result, Los Angeles City and County, as well as a number of jurisdictions in Orange County, have adopted retrofit regulations for tilt-up buildings.

The outward collapse of tilt-up walls poses a potential risk to persons and property adjacent to the building.

Reinforced masonry buildings may have a more localized partial collapse of a roof and/or floor as a section the wall bows outward. There is an injury potential as well as property damage issue for these building types. However there is no record of injury from failure of such a building type. There are about 196 commercial buildings of this type of construction.

Liquefaction Zone

Some areas of the city have a high water table. Where this condition occurs, it is possible for the ground to liquefy during an earthquake, becoming like quicksand. If this occurs, buildings may settle or tilt. Such damage occurred in the Marina District in San Francisco in the 1989 Loma Prieta earthquake. Adjacent buildings may be affected quite differently. Rehabilitation is difficult. There is no simple or cost-effective method to mitigate this condition. The liquefaction hazard zone in the city was determined in a previous study by Woodward Clyde Associates. In that report they identified faults areas, areas of potential landslides and

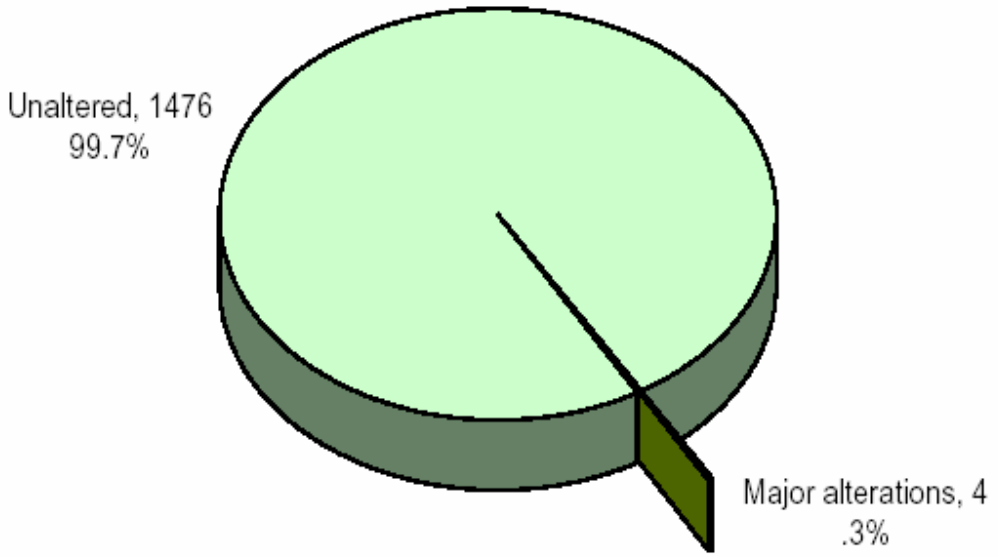
liquefaction hazard zones. The determination of these zones was mandated by the Public Resources Code, Division 2, Seismic Hazard Mapping Act – Chapter 7.8. The potential for liquefaction is considered for all new construction in the city. In Beverly Hills, there are about 1000 buildings that may be subject to soil liquefaction. The result is the potential for property damage and loss of buildings.

Number of Buildings Rehabilitated

The number of buildings that have been rehabilitated is few compared to the total building stock.

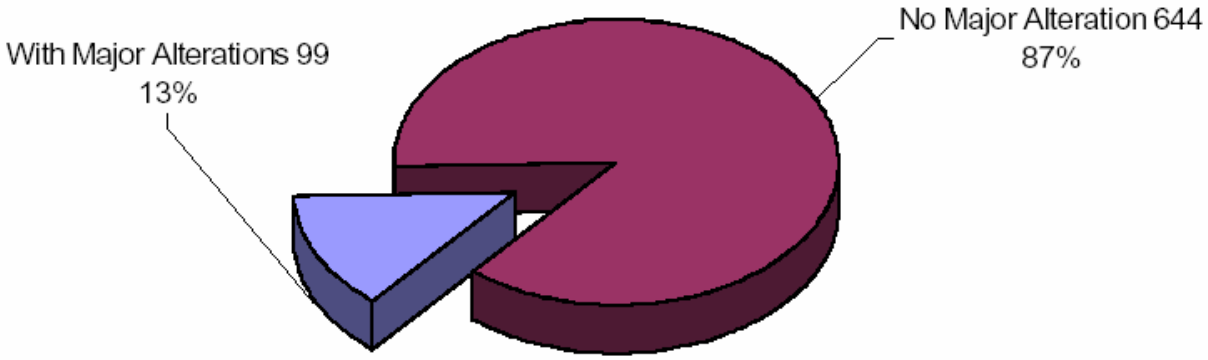
Only four of the pre-1976 code multi-family residential buildings have had major alterations. Foundation anchor bolt upgrades, not considered to be major alterations, have been accomplished on 33 buildings in the past 10 years. There are about 1000 more buildings where foundation anchorage upgrades are needed.

Percentage of Multifamily Residential Buildings with Major Alterations Since the 1976 Code



It was more difficult to determine whether the work done on commercial structures included retrofit. There were 99 major rehabilitations of pre-1976 code commercial buildings in addition to required retrofits for unreinforced masonry. If it is assumed that these 99 rehabilitations included seismic work, less than fifteen percent of these structures have been retrofitted. However, additional research will be required to verify the extent of seismic upgrades.

Percentage of Commercial Buildings Having Major Alterations



VI. Summary

The building stock of Beverly Hills is older than that of many communities in California. A high percentage of the buildings were constructed before provisions based on the experience of the 1971 San Fernando earthquake were introduced into the 1976 edition of the building code, and began to be applied in 1981.

While engineers are comfortable with the safety and property damage improvements effected by these building code changes, we still need to be aware of the potential risk of the older existing building stock. Post-1976 earthquake experience including the 1994 Northridge earthquake as well as the 1989 Loma Prieta (San Francisco Bay Area), 1987 Whittier and the Mexico City earthquakes, remind us of the potential risk posed by some of these building types. Future earthquakes may result in additional code changes being applied to future buildings; but the known risk potential of existing building types remains.

To reduce the risk of death and injury, as well as that of property damage, adoption of a group of seismic safety policies is suggested. The policies are not for immediate implementation. Many of these policies can be implemented over a period of years. Measures to mitigate these risks may vary on the risk and building type. Some may require some ordinances and incentives.

But the potential risk is there and first steps in an action plan are highly encouraged.

I. Implementation Considerations

A number of jurisdictions have added mandatory or other approaches to encourage seismic rehabilitation of existing buildings in addition to the work completed on the unreinforced masonry buildings.

Approaches may be classified by several types. These are:

1) Mandatory – A specific building type is required to be retrofitted by a certain date. With this type of work the notification of owners may be scheduled over a period of years to minimize the impact on the community and not have too many projects underway at any one time. Building types that have been subject to such provisions include multi-family residential buildings with soft-stories, concrete wall tilt-up buildings and steel frame buildings. Santa Monica has a mandatory strengthening ordinance for soft-story apartment buildings. The California Earthquake Authority (earthquake insurance issuer) has an insurance fee reduction for cripple wall correction and anchor bolt installation,

Change of Character-of-Use Triggers – The current building code has requirements for upgrade with a change of use. In this case, when a building's character of use changes, the building is required to meet the current building code requirements. Use of this trigger is valid for use changes involving entire buildings, such as changing mercantile to dining, or converting an office building to multi-family residential use. However, if a single tenant space in a major building changes use, it is problematic to impose retroactive requirements on the entire structure.

Trigger on Major Remodel – A major remodel could be a trigger for seismic retrofit. Any major structural change such as an addition or structural alteration above a certain dollar figure is another potential means of triggering strengthening.

Reroofing Permits – Some work may be accomplished from the roof in a relatively economical manner. A trigger for buildings with masonry or concrete walls and wood roofs could be a reproofing permit.

Tenant Change – Require partial strengthening when there is a change of tenant or when an entire floor becomes vacant.

Trigger on Sale – There have been proposals for mandatory rehabilitation for anchor bolts and cripple stud wall buildings when the building is sold. Similar concepts may be applied to other structure types. Obviously, a consequence of such a requirement would be to not sell the building.

2) Incentives

Grants and Loans to Building Owners Incentives – Many cities have used rehabilitation grants and loans to building owners. Studies have shown

that a modest grant will encourage owners to strengthen their buildings. Such a policy might be appropriate for multi-family residential structures.

Land Use Planning Incentives – Many fees and limitations are triggered on reconstructing or adding to a building. Further there may be land use regulations that will discourage replacement. These should be reviewed for applicability to any safety policies.

Accelerated Depreciation for Rent Controlled Units – In buildings that are under rent-control, the costs for any rehabilitation work might be added to the rent. The time for write-off of such expenses could be accelerated to a point where cost recovery for the owner would be attractive.

II. Policy Recommendations

Based on the earthquake history, and future potential earthquakes, of the Los Angeles basin, the following preliminary policies for the safety element are suggested. The policies are ranked by order of importance for risk to the community.

Policies for wood frame buildings will typically relate to multi-family housing. Policies for masonry, concrete and steel building will usually be for commercial structures. However some multi-family residential buildings are of concrete or masonry of construction.

The number of persons at risk is based on census data of a city-wide average of 1.9 occupants per housing unit for multifamily residential. The number of occupants in nonresidential buildings is assumed to be 25% of the building code maximum occupant load.

Technical Basis for Recommendations

The California Seismic Safety Commission (CSSC), as well as the Federal Emergency Management Agency (FEMA), have published a number of reports and recommendations regarding existing buildings.

The following documents served as the basis of the policy recommendations

The current policy document of the CSSC:

California Earthquake Loss Reduction Plan

California Seismic Safety Commission Report SSC 02-02 - Specific goal is Initiative 6.4.3: "Identify and prioritize all seismically vulnerable public and private buildings. Establish a mitigation plan to reduce the risk posed by those buildings, including structural and nonstructural elements, equipment, and contents. The most vulnerable and the most essential buildings should be addressed as the highest priority."

Northridge Earthquake - Turning Loss to Gain, CASSC Report to the Governor, 1995 - This report encourages state legislation to require the General Plan Safety Element to include generalized descriptions of seismically vulnerable building types by neighborhood and a plan to mitigate the risk from these buildings. (This was not adopted into law. Also proposed was a provision that the safety element address seismic vulnerability of the building stock and that it be updated every five years.)

Public Policy and Building Safety, Earthquake Engineering Research Institute, 1996 - Identification of buildings that pose a potential risk are based on the following FEMA publications:

FEMA 154 – Rapid Visual Screening **of Buildings for Potential Seismic Hazards: A Handbook**

FEMA 310/ASCE-31 Seismic Evaluation of Existing Buildings - Additional reports include the Guidelines for the Seismic Retrofit of Existing Buildings, now part of the International Existing Buildings Code (IEBC).

The Federal Emergency Management Agency also has a series of books underway to encourage strengthening of building by phasing the work, called Incremental Seismic Rehabilitation.

Policy Number 1

Policy: Buildings with tuck-under parking that constitutes a soft story should be strengthened to prevent collapse.

Building Use:	Multi-family residential
Type of Construction	Wood Frame with tuck-under parking.
Safety Issue	Tuck-under parking may be at grade or dipped below ground level. This type of structure is considered a soft-story. The Northridge Meadows apartment building collapsed in 1994 with over 15 deaths; it was of such construction. Many other tuck-under parking buildings were damaged throughout the valley, Santa Monica and the West side in the 1994 Northridge Earthquake.
Consequences of Damage and Failure	Deaths and injuries are possible. Loss of housing stock.
Probability of loss	High
Number of such buildings in the city	454
Estimated Number of Occupants*	4,400
Number of Housing Units	2,315
Potential Effects of No Activity	Potential for death and injury Probability of loss of housing, causing need for significant post-disaster services including housing, food and other social services.
Rehabilitation Program	A rehabilitation program would correct this problem. It requires rehabilitation in the open parking areas of buildings. It can be accomplished while the building is occupied and with no loss of existing off street parking.

Policy Number 2

Policy: Wood buildings with short cripple studs under the first floor should have wall bracing installed from the foundation to the first floor.

Building Use:	Multi-family residential
Type of Construction	Wood Frame with Cripple Wall Construction
Safety Issue	Cripple wall construction consists of short wood studs below the first floor. The cripple studs topple during an earthquake causing the building to fall.
Consequences of Damage and Failure	Occupants may be injured by building contents as the building falls. Deaths are possible. Repairs are similar to a house moving project, and are costly and difficult.
Probability of loss	High
Number of such buildings in the city	1,270 Note: The survey is from the building's exterior. Thus the number of buildings is inexact.
Estimated Number of Occupants*	12,250
Number of Housing Units	6,450
Potential Effects of No Activity	The potential for death and injury is there but most of the loss will be to property and the loss of housing. There will be a need to provide significant services in a post-disaster situation. This could include housing, food and other social services
Rehabilitation Program	A rehabilitation program is available. It consists of adding plywood panels to the studs below the first floor line. Costs are modest. For many of the buildings the construction cost would be under $10,000. Damage repair would typically be more than $50,000. There is typically no disruption to the building occupants.

Policy Number 3

Policy: Wood buildings constructed without positive connection from the foundation to the structure should have anchor bolts installed.

Building Use:	Multi-family residential
Type of Construction	Wood Frame
Safety Issue	Lack of Anchor Bolts
Consequences of Damage and Failure	Buildings constructed without anchor bolts have slid on their foundations during earthquakes. This is a property damage issue unless the building also has cripple studs. Repairs can be costly as it becomes a house moving job. It is possible to sever a gas line that could result in a fire.
Probability of loss	Moderate
Number of such buildings in the city	960 Note: The survey is from the building's exterior. Thus the exact number of buildings is inexact.
Estimated Number of Occupants*	7,300
Number of Housing Units	3,843
Potential Effects of No Activity	Damage to buildings. This would result in loss of housing and to provide assistance in a post-disaster situation.
Rehabilitation Program	A rehabilitation program would correct this situation. It involves no disruption to occupants during the work.

Policy Number 4

Policy: All pre-1981 non-ductile concrete frame buildings three stories or more in height should be seismically rehabilitated.

Building Use:	Commercial and Multi-family residential
Type of Construction	Non-ductile Concrete Frame
Safety Issue	Concrete frame buildings constructed prior to the implementation of the 1976 building code do not have the ductility to move and sway during an earthquake. Typically such buildings were constructed before 1980 in Beverly Hills.
Consequences of Damage and Failure	Concrete frame buildings collapsed in the 1994 Northridge earthquake and were a major cause of death in the recent Turkey and Mexico City earthquakes. Major damage occurred to buildings of this type of construction in Beverly Hills along Wilshire Blvd in 1994. If the earthquake occurred during occupied hours the death toll would be significant.
Probability of loss	High
Number of such buildings in the city	Commercial – 39 Multi-family residential – 4
Estimated Number of Occupants*	Commercial – 22,500 Multi-family residential – 2090
Number of Housing Units	1100
Potential Effects of No Activity	The chance of multiple concrete buildings collapsing during an earthquake is significant. The loss in the multi-family residential sector could be as many as 1100 dwelling units. In the commercial triangle and along Wilshire Blvd, the effect could be major with loss of life, disruption to the city, major business and community interruption and loss of tax base.
Rehabilitation Program	Rehabilitation would reduce the chance of death and injury a significant

	amount. Rehabilitated buildings would incur some damage in an earthquake, but would generally be repairable and back in operation within a reasonable time.

Policy Number 5

Policy: "Soft-Story" buildings, three stories or greater and constructed prior to 1981, should be strengthened

Building Use:	Commercial and Multi-family residential
Type of Construction	Concrete buildings with a soft story (Discontinuous shear walls)
Safety Issue	Soft story concrete buildings have partially collapsed in the 1971 Sylmar and the El Centro earthquakes. Examples are the Olive View Hospital in Sylmar and the Community Services Building in El Centro.
Consequences of Damage and Failure	Potential for life loss and injury. Property damage is a major element usually resulting in the loss of the building.
Probability of loss	High
Number of such buildings in the city	Commercial – 47 Multi-family residential - 44
Estimated Number of Occupants*	Multi-family residential – 1,870
Number of Housing Units	986
Potential Effects of No Activity	There is a significant chance of multiple buildings collapsing during an earthquake. The loss in the multi-family residential sector is unknown, but could be as many as 986 dwelling units. In the commercial triangle and along Wilshire Blvd, the effect would be major, with loss of life, disruption to the city, major business and community interruption and loss of tax base.
Rehabilitation Program	Rehabilitation would lessen the chance of death and injury significantly. Rehabilitated buildings might incur some damage in an earthquake, but would generally be repairable and back in operation within a reasonable time.

Policy Number 6

Policy: Tilt-up concrete wall buildings are to be retrofitted to reduce the chance of walls falling outward.

Building Use:	Commercial and Industrial
Type of Construction	Tilt-up Concrete Buildings
Safety Issue	The concrete wall panels on tilt-up buildings have fallen outward in past earthquakes. This occurred in a number of areas of Northern California in 1989 and in the San Fernando Valley in the 1971 and 1994 earthquakes. Numerous cities in Southern California, including Los Angeles, LA County, Irvine and Fullerton have such regulations.
Consequences of Damage and Failure	A wall panel could fall outward on a public or semi-public area. Loss of building use.
Probability of loss	High
Number of such buildings in the city	2
Estimated Number of Occupants*	Not determined
Number of Housing Units	0
Potential Effects of No Activity	Risk remains
Rehabilitation Program	Additional anchors and cross ties are to be installed at the roof line of the buildings. Costs are moderate.

Policy Number 7

Policy: Encourage owners to strengthen open front low rise concrete and masonry buildings

Building Use:	Commercial
Type of Construction	Concrete and Reinforced Masonry with Open Fronts
Safety Issue	The open front is a soft story. It could move laterally causing damage to the building and the façade glass. The glass would break outward endangering pedestrians and occupants. These are typically buildings from 1 to 3 stories in height.
Consequences of Damage and Failure	Injury and building damage
Probability of loss	Low to Moderate
Number of such buildings in the city	196
Estimated Number of Occupants*	8,000
Number of Housing Units	
Potential Effects of No Activity	Risk to the public and building occupants remain.
Rehabilitation Program	Requires additional construction on the open side.
How to do this	
Possible Incentives	

Policy Number 8

Policy: Buildings in the liquefaction zone to be reviewed for risk of damage and injury

Building Use:	Commercial
Type of Construction	All
Safety Issue	Liquefaction - Loss of foundation support may result in buildings settling or listing in an earthquake. This occurs only in high water areas mapped in the city
Consequences of Damage and Failure	Minor damage to building collapse
Probability of loss	Low
Number of such buildings in the city	Commercial – 302 Multi-family residential - 693
Estimated Number of Occupants*	Commercial – 27,500 Multi-family residential - 8900
Number of Housing Units	4680
Potential Effects of No Activity	Buildings could sustain damage in future earthquakes
Rehabilitation Program	Evaluation and possible construction work

SECTION 7

WILDFIRE

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WHY ARE WILDFIRES A THREAT TO THE CITY OF BEVERLY HILLS

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 such as Beverly Hills which are built within or adjacent to hillsides and mountainous areas. The areas in Beverly Hills most susceptible to a large and destructive wildland/urban interface fire include the areas north of Sunset Blvd., extending north to the city limits. There is a huge potential for losses due to wildland/urban interface fires in Southern California and Beverly Hills in particular. The narrowness of the roads, the presence of medium to heavy native fuel beds, and the high density of very large structures built in this area all contribute to the potential for disaster. These factors are exacerbated several times per year when Santa Ana wind conditions make the threat of fire even greater than normal. 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 **(19)**. According to CDF statistics, in the October, 2003 Firestorms, over 4,800 homes were destroyed and 22 lives were lost **(20)**.

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.

Chart 16: 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

HISTORY OF FIRES IN SOUTHERN CALIFORNIA

There has not yet been a wildland fire of any significance in Beverly Hills, and the last large wildland fire adjacent to the city occurred in Franklin Canyon over 50 years ago. Large fires have always been part of the Southern California landscape. "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." **(21)**.

Chart 17: 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

"Structures" is meant to include all loss - homes and outbuildings, etc.

Source: http://www.fire.ca.gov/FireEmergencyResponse/HistoricalStatistics/PDF/20LSTRUCTURES.pdf

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 **(22)**.Taxpayers spent more than $1.6 billion **(23)** 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. Chart 12 illustrates fire suppression costs for state, private and federal lands.

Chart 18: 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

Source: http://research.yale.edu/gisf/assets/pdf/ppf/wildfire_report.pdf

CAUSES AND CHARACTERISTICS OF WILDFIRES IN SOUTHERN CALIFORNIA AND BEVERLY HILLS

There are three categories of interface fire **(24)**. 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.

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.

WILDFIRE HAZARD IDENTIFICATION

The city faces an ongoing threat from wildfires along its hillsides and mountainous areas where wildland and residential areas interface. Fires can be sparked by human activity

and natural causes. The next section will further describe the areas in which the hazard can occur.

THE INTERFACE

Beverly Hills is like many Southern California communities that are challenged by the increasing number of houses being built on the urban/wildland interface. The National Wildland Coordinating Group defines urban/wildland interface as "the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.

In 1992, Assembly Bill -337, known as the "Bates Bill", required all cities and counties in California to identify within their communities "The Very High Wildland Fire Hazard Severity Zones" or VHFHSZ.

In Beverly Hills, this VHFHSZ was identified as all of the area north of Sunset Boulevard and extending north to the city limits. This is a densely populated area with homes embedded in natural and landscaped vegetation. A total of 1640 parcels fall within this area for a total valuation of 2.99 billion dollars.

Once the city identified this VHFHSZ and submitted it to the California Department of Forestry and Fire Protection, the state required that an ordinance be passed covering the following elements in the identified zone:

- Minimum standards on roof coverings
- Minimum standards on clearances around occupied dwellings by removal of combustible vegetation
- Minimum standards on clearances of tree limbs around chimneys
- Regulations regarding the maintenance of trees and their litter on and around structures

When passing the ordinance, Beverly Hills chose to exceed the minimum requirements set forth by the state.

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

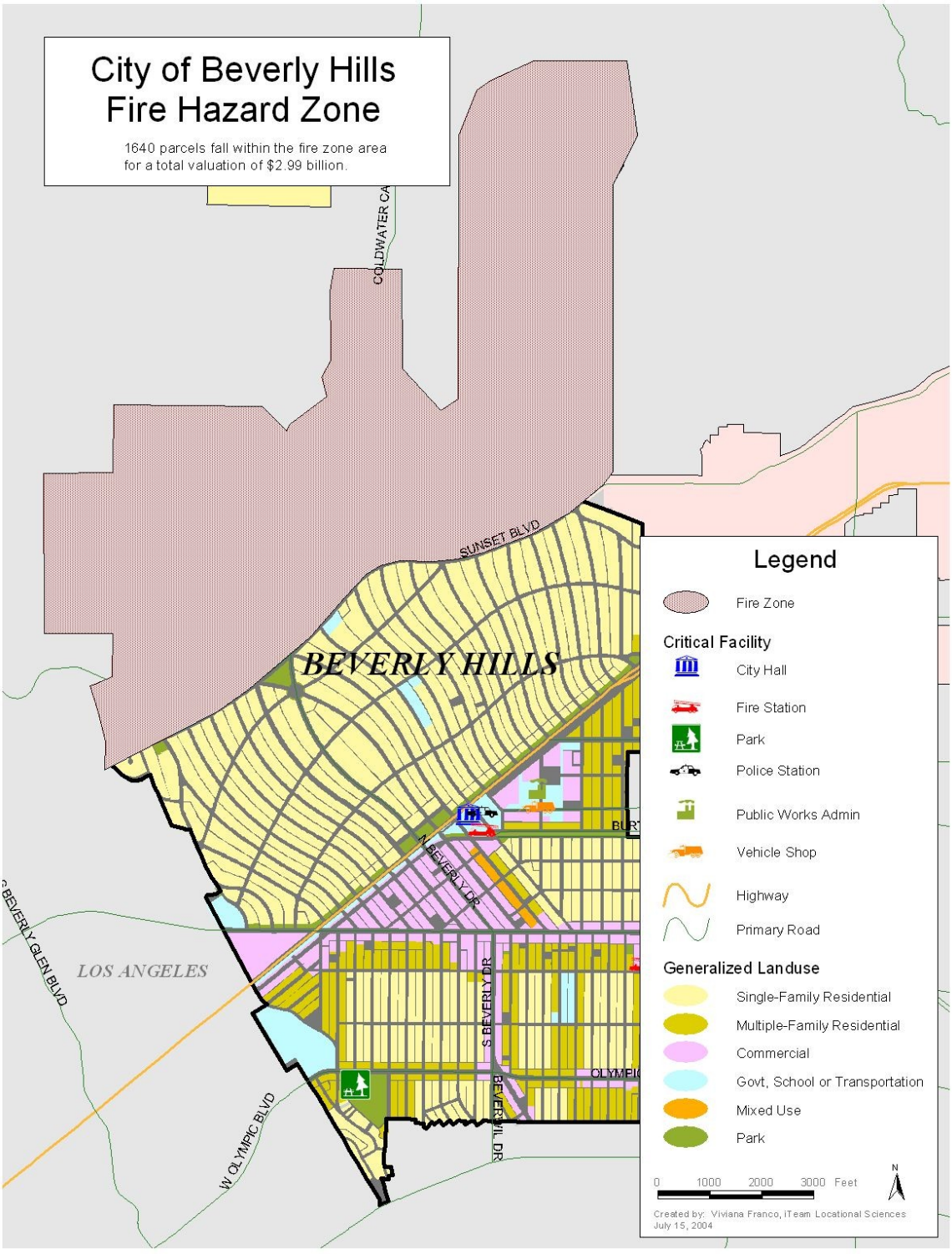
> single largest urban fire, and the single largest earthquake loss, in U.S. history. The loss over three days of more than 28,000 buildings within an area of 12 km^2 was staggering: $250 million in 1906 dollars, or about $5 billion at today's prices.
>
> The 1989 Loma Prieta Earthquake, the 1991 Oakland 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." **(26)**

This scenario highlights the need for fire mitigation activity in all sectors of the region, urban/wildland interface or not. Beverly Hills could conceivably experience such a fire in the areas outside of the VHFHSZ either as a result of an earthquake or some other phenomenon. Possible scenarios include a disruption in the water system that could allow a normally controllable structure fire to escape containment by fire forces and spread to adjoining buildings. Another scenario is a fire that starts in the flatlands and could be wind driven from the roof of one building to the roofs of adjoining buildings. In the area outside the VHFHSZ, many wood shake or shingle roofs exist and there is a potential for fires being driven from roof to roof faster than firefighting efforts can keep up under strong Santa Ana wind conditions.

Other large dollar loss or large life loss fire potential exists within the city as well. Beverly Hills is home to 3 very large hotels having occupancies in excess of 500 persons per day, 32 High Rise buildings, and a densely populated retail and commercial district. Of particular concern are two High Rise buildings that are residential occupancies and did not fall under the 1998 retrofit sprinkler mandate imposed on buildings 55 feet or higher. These are the only two High Rise buildings in the city that are not set up with sprinkler systems and no plans exist to install the systems.

Identifying the hazard area as set forth above is the first step in assessing the City's vulnerability to wildland fires. Other key factors 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. These factors can affect how quick a fire can spread.

Map 11: Fire Hazards Zones



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. Like much of Southern California, chaparral is a primary fuel prevalent in Beverly Hills along with grasses, non-native vegetation and large trees such as Junipers, Palm, Eucalyptus and Pines. All of these fuel types are highly combustible. Added to this is the fact that a large percentage of the fuel beds in the Santa Monica Mountains contain dead and down vegetation. This "die back" condition as it is known is due largely to drought conditions that have been experienced in recent years. This condition makes these fuel beds far more receptive to ignition and spread of wildfires than if the vegetation were alive and healthy. This type of fuel model is of particular concern when the fires are wind driven as it can lead to short and long range spotting which can affect the entire city, not just the VHFHSZ.

Comment [vf1]: Does BH have a large amount of chaparral covered areas? If so, where?

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. 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 areas above Sunset Boulevard, east of Benedict Canyon Dr, and extending to the eastern city limit contain all of the topographic features mentioned above. Another area of concern in Beverly Hills is that most of the developed area in the city is on south facing slopes. Southern facing slopes are exposed to more thermal heating by the sun and fires will start and spread more readily due to the pre-heated condition of the fuel and the lower fuel moisture content. Numerous canyons, saddles, and ridges in the VHFHSZ will also contribute to erratic fire behavior due to the funnel and subsequent acceleration effect it will have on wind traveling through the area.

Comment [vf2]: Where would these areas be in BH?

Comment [vf3]: Is there any such communities in BH? Where?

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 (25). 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 "Santa Ana" winds, which are heated by compression as they

Comment [vf4]: Perhaps we can cite a specific example of how Santa Winds contributed to a fire in BH or Southern California? We can also mention that the winds pose a very serious threat to BH because of their history of being fire catalysts.

flow down to Southern California from Utah create a particularly high risk, as they can rapidly spread what might otherwise be a small fire.

Beverly Hills experiences Santa Ana Wind conditions typically in the Fall months and this poses a threat in two ways. A fire starting in Beverly Hills will spread rapidly and has the potential of overwhelming initial attack forces and destroying structures within minutes of ignition. A fire starting adjacent to Beverly Hills in the City of Los Angeles could quickly burn into the city either by direct flame contact or by fire brands being carried by the winds and spotting onto structures or combustible vegetation. Wind bends the flames to pre-heat the fuel ahead and can carry fire brands up to ¼ mile or more ahead of the flame front. The majority of catastrophic fires that Southern California has experienced have occurred in the months of September, October, and November when Santa Ana Winds typically occur. Wind is considered to be the primary factor that influences fire spread.

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. Southern California is currently in its sixth year of drought conditions.

Comment [vf5]: How common are these dry winters in BH/Southern California?

Comment [vf6]: How low have BH's reservoirs been during times of drought? The early 90's? Ans. You would have to ask the WD about the reservoirs.

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. Narrow and winding roads in these developed areas tend to make evacuation of civilians slow and difficult especially when fire resources are trying to gain access to the area utilizing the same roads. The development in Beverly Hills in the VHFHSZ is exemplified by the above description, however is complicated by the presence of very large homes, very often exceeding 10,000 square feet in livable area. Most of the new development in this zone involves the removal of smaller structures in order to build much larger structures in their place.

WILDFIRE 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.

Chart 19 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.)

Chart 19: 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

Comment [r7]: Should all of this be replaced by what I added below?

In order to comply with the Bates Bill, in 1992 the City completed an evaluation of the following factors to determine the areas of the City which would qualify as a Very High Wildland Fire Hazard Severity Zone.

- Fuel
- Topography
- Dwelling density
- Weather
- Infrastructure
- Fire codes and ordinances as they relate to brush issues

Each factor was given a value of 1-4 with a 4 being the highest danger rating. Any total score over 10 qualified the area as being one of VHFHSZ. Each of the three areas evaluated rated 10 or above with the highest area receiving a 12.

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.

Comment [r8]: Is this all somewhat redundant in relation to the above?

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.

WHAT IS SUSCEPTIABLE TO WILDFIRE

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.

A fire starting in the VHFHSZ has the potential to grow to devastating proportions which would destroy a great number of homes, infrastructure facilities, natural habitat, but more importantly, it has the potential for taking many lives. The "Tunnel" fire in the East Bay Hills (Oakland) in 1991 would be the best example of the type of fire potential that exists here in the city. That fire took 25 lives and destroyed over 3,500 dwelling units within a matter of a few hours. Beyond the impact of the loss of life, there will be significant and far reaching economic impacts on the community as it recovers and rebuilds in the aftermath of such a fire.

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

Water supply, both in terms of volume and pressure, is always a critical factor in fighting fires and particularly in keeping fires in the wildland/urban interface areas manageable by initial attack forces. Generally speaking the water supply to most areas of the City is very good, however an area of concern is the area served by Zone 9. This area is known to have insufficient fire flow and plans are being developed to improve the flow capacity and reliability to this area. 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.

Comment [vf9]: Is this specific to BH? Maybe we can add what water limitations BH fire fighters face? Perhaps comment on how many water reservoirs we have, any rivers, etc. Would someone in PW know how many miles of waterlines we have? Some stats. Like that would really be nice in here!

Comment [r10]: I think I might delete this section if you want to use what I put ahead of it.

EXISTING MITIGATION ACTIVITIES

Weed Abatement Programs

Beverly Hills Fire Department maintains an aggressive annual Brush Clearance Inspection program. Mailings to residents begin in early May and physical inspections begin in early July. Properties who have not complied with clearance requirements are ultimately referred to the City prosecutor's office. The City also utilizes mailings, WebPages, and local cable television programs as an integral part in educating the public of the need for brush clearance, non-combustible roofing, and pre-established evacuation routes.

Pre-Attack Plans

For the high-hazard zone, the Beverly Hills Fire Department has developed a set of "Pre-Attack Plans" that enable the fire suppression resources to locate combustible roofs,

evacuation routes, and safe refuge areas and Resident Assemblage Points. These plans are a great asset in helping firefighting forces make critical decisions during emergency situations. The plans are also made available to outside agencies who are called for Mutual Aid assistance and that may not be familiar with the area. These plans are reviewed annually by all personnel and updated every year.

Remote Automated Weather Station (RAWS)
In 1998 Beverly Hills became part of the National Fire Weather Danger Rating System by installing a Remote Automated Weather Station (RAWS) just outside the city in Franklin Canyon. This RAWS is tied into other weather stations located throughout L.A. County that provide weather data that is analyzed by a computer which then gives a numerical value to the fire weather danger in Beverly Hills and for L.A. County communities. The RAWS also allows the Beverly Hills Fire Department to monitor its microclimate on demand when needed. Data from this RAWS assists fire officials in determining the need for augmenting or redeploying fire resources depending on current and anticipated weather conditions.

Red Flag Engine Program
Since the addition of the RAWS, the Beverly Hills Fire Department has instituted a Red Flag Engine Program whereby the firefighting resources are augmented in the VHFHSZ on days where the fire weather danger is extremely high. The program calls for hiring additional personnel to staff an engine company which is then housed at Fire Station 2 for the duration of the extreme danger period. In addition to staffing the additional engine company, pre-designated streets which normally allow parking, are posted as no parking zones to allow for ingress of fire resources and egress of civilian traffic.

The Beverly Hills Fire Department provides ongoing community education with the following programs:

- Annual Occupancy Inspections for all public, commercial and R-1 & R-3 occupancies
- CERT (Citizen Emergency Response Team) training

The Beverly Hills Fire Department educates the public in terms of Fire and Life Safety by providing the following special programs upon request:

- Fire Safety Education Programs that consist of the following:
- Local cable television education and informational programs are shown throughout the year, but most often during the months considered to be fire season. A video has been produced warning citizens of the danger of wildland fires and provides information as to how to prevent them and how to react should one start
- Mailings such as the RSVP Program which educates the public on fire retardant roofs, seismic awareness, vegetation management, and overall preparedness.
- Informational brochures have also been prepared and are distributed informing citizens about the need for evacuation plans and tips on home protection.
- Disaster Assistance Programs that are taught to Beverly Hills Unified School District employees

- Fire Safety and Prevention in schools

Teleminder System
To assist in the notification and early warning of the residents in the high-hazard zone, an automated computer dialing system called Teleminder is used. This system can make hundreds of calls to a geographical area within minutes and will broadcast a customized message to whomever, or whatever answers the phone.

LOCAL FIRE CODES
The following codes have been adopted and are applied to the northern areas of the community which have been deemed the VHFHSZ.

Section 103 is hereby amended by adding section 103.4.8 as follows:
Section 103.4.8 Very High Fire Hazard Severity Zone.

A Very High Fire Hazard Severity Zone (VHFHSZ) is hereby established and declared to be those districts and areas included within the boundaries described and set forth in a map maintained by the Chief on file in the office of the Fire Marshal.

Appendix II-A, Section 16.1, is hereby amended as follows:
Appendix II-A, Section 16.1(1-5) Clearance of Brush or Vegetative Growth from Structures.

A. All native brush, weeds, grass and hazardous vegetation situated within one hundred (100') feet of ANY structure, regardless of whether said structure is located upon such land or upon adjacent land shall be maintained at a height of not more than three (3") inches above the ground.

B. All native brush, weeds, grass and hazardous vegetation within ten (10') feet of any combustible fence shall be maintained at a height of not more than three (3") inches above the ground.

C. All trees, shrubs, bushes, and other growing vegetation or portions thereof, adjacent to or overhanging any structure shall be kept free of dead limbs, branches, and other combustible matter.

D. All trees shall be trimmed up five (5') feet from the ground and maintained so that no portion is closer than ten (10') feet from the outlet of any chimney.

E. All roof structures shall be kept free of substantial accumulations of leaves, needles, twigs, and other combustible matter.

F. ALL CUT VEGETATION AND DEBRIS SHALL BE REMOVED AND LEGALLY DISPOSED OF. All vegetation, native or otherwise, shall be maintained so as not to constitute a fire hazard or public nuisance.

Exception: Specimen native shrubs can be retained throughout the 100 feet provided they are: spaced at a distance not less than eighteen (18') feet from other native shrubs, brush or structures; maintained free of dead wood and litter; and trimmed up at least two (2') feet from the ground or 1/3 of their height, whichever is less.

G. If the Fire Chief determines in any specific case that difficult terrain, danger of erosion, or other unusual circumstances make strict compliance with the clearance of vegetation provisions of this section undesirable or impractical, he may suspend the enforcement thereof and require reasonable alternative measures.

Appendix II-A, Section 17, is hereby amended as follows:
Appendix II-A, Section 17 - Clearance of Brush or Vegetative Growth from Roadways.

All native brush, weeds, grass and hazardous vegetation situated within ten (10') feet of the outer edge or edges of the usable road surface of any highway, street, alley or driveway serving more than one residence shall be maintained at a height of not more than three (3") inches above the ground.

Section 1003.2.1 is hereby amended as follows:
Section 1003.2.1 New buildings.

An automatic fire extinguishing system shall be required for all occupancies, except U-1 occupancies which are sheds of less than five hundred (500) square feet and agricultural buildings. Systems for R-3 occupancies shall comply with the "N.F.P.A. Standard No. 13D for Residential Sprinkler Systems for One and Two Family Dwellings", 1999 Edition, and systems for all other occupancies shall comply with the "N.F.P.A. Standard No. 13 for Installation of Sprinkler Systems", 1999 Edition.

Section 1003.2.1.1 is hereby added as follows:
Section 1003.2.1.1 Existing buildings.

(1) All existing buildings, except R-1 occupancy cooperatives, apartments, and condominiums, having a usable floor area of five (5) stories, or which exceed a height of fifty-five (55) feet, shall have an automatic fire extinguishing system in compliance with section 1003.2 installed and operational not later than September 1, 1991. "Height," for purposes of this Section, is defined in Section 10-3.100 of Title 10 of the Beverly Hills Municipal Code.

(2) Any existing building which is not required to have an automatic fire extinguishing system pursuant to subparagraph (1) of section 1003.2.1.1 shall install an automatic fire-extinguishing system in compliance with section 1003.2.1 if: (i) additions, alterations or repairs are made within any twelve (12) month period which exceed fifty percent (50%) of the value of such existing building, (ii) an addition is constructed which exceeds fifty percent (50%) of the square footage of the existing

building, or (iii) an addition of more than five thousand (5,000) square feet is constructed.

Section 1503.4 is hereby added to the California Building Code as follows:
1503.4 Class A roof covering requirement.

Notwithstanding any other requirement of the Beverly Hills Municipal Code, no later than July 1, 2013, all roof coverings in the City of Beverly Hills shall be fire retardant Class A, as classified in Section 1504.

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 **(27)**.

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.

Comment [r11]: I think you could delete this

OTHER MITGATION 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.

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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.

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POSSIBLE WILDFIRE MITIGATION ACTIVITIES
Recently, the area in the VHFHSZ underwent an assessment by the Firewise Communities USA program. From this assessment, a series of recommendations will be considered by a council formed by community members. This committee will also be responsible for enacting the recommendations and shepherding them through the various processes that are required.

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.

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The Firewise Communities/USA program is designed to provide an effective management approach for preserving wildland living aesthetics. The program can be tailored for adoption by any community and/or neighborhood association that is committed to ensuring its citizens maximum protection from wildland fire. The program begins with a community assessment that is intended to be used as a resource to create a wildland protection plan. The plan developed from the information in this assessment should be implemented in a collaborative manner and will be updated and modified as needed. This assessment was conducted in early May of 2004 and the plan was delivered to the department in June. The plan is currently under review and consideration for adoption. Some of the highlighted mitigation strategies that have been identified are as follows:

- Replacement of flammable wood roofs - Currently and ordinance requires that all non Class A roof coverings be replaced by the year 2013. An accelerated plan for replacement of these roofs will make the community safer, sooner.
- Residents must be vigilant in removing accumulations of dead foliage and needles from roofs and around structures.
- Eucalyptus is a popular landscaping choice in the assessment area and while these trees themselves are not a significant fire problem, the material they shed is a significant hazard. The dead material that these trees shed can contribute to home ignition potential and needs to be cleared on a consistent basis.
- Other trees such as mimosa, sycamore, walnuts and palms also need annual grooming. Of particular concern is palm tree beards which are easily ignited by flying fire brands. These trees, whether on public or private property need to be groomed on an annual basis.

Another strategy not mentioned in the report, but that could prove significant in the fire department's ability to save structures is to increase the brush clearance requirements. The current ordinance calls for clearance of 100 feet around structures in the VHFHSZ. Many communities have increased this distance to 200 feet. This distance is considered to be the "defensible space" that allow fire departments to safely deploy resources with a reasonable expectation that the structure can be saved. In those communities that have

experienced fires where 200 feet is the rule, the fire department has been far more successful in saving the structures threatened even by the worst wind driven fires. Fuel modification/removal programs should also be considered in those areas that due to build up of dead and live fuels combined with topographical features pose the greatest threat to individual structures or the neighborhood. These programs may include prescription burns, use of a "brush crushing" machine or simple removal by tractors or hand crews.

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 ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation. Enhance emergency services to increase the efficiency of wildfire response and recovery activities.

WILDFIRE MITIGATION STRATEGIES

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." **(28)**

For full FIRE Mitigation Strategies please see Section 4.

SECTION 8

TERRORISM

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WHY IS TERRORISM A THREAT TO THE CITY OF BEVERLY HILLS

Terrorism has touched the U.S. at several locations over the years. After the September 11, 2001 World Trade Center airplane bombing, citizens no longer viewed terrorism as just a foreign problem. In recent years, terrorism has taken on new form with the introduction of chemical, biological, and radiological weapons.

Terrorism is a continuing threat throughout the world and within the United States. A variety of political, social, religious, cultural, and economic factors underlie terrorist activities. Terrorists target civilian targets to spread their message or communicate dissatisfaction with the status quo. The media interest generated by terrorist attacks makes this a high visibility threat.

The City of Beverly Hills is known around the world for its wealth, hosting visiting international dignitaries and celebrities, and to being the home to many famous people. This makes the City a target for terrorist activity.

Recent trends toward large scale incidents generating significant casualties make preparedness and the mechanisms for effective response essential. In addition to large scale attacks, a full range of assault styles must be considered. Contemporary terrorist activity runs the gamut from simple letter bombings, assassinations with small arms, bio-chemical attacks, car, and suicide and building bombings to full-out attacks.

Bombings and arson remain significant sources of terrorist activity. Related threats include bomb threats, which disrupt the normal operations. Venues likely to suffer the impact of terrorism include government facilities, entertainment and cultural facilities: the business triangle, City Hall, Rodeo Drive and the popular hotels are possible targets*. Conventional political motivations for terrorism continue, however, issues involving weapons proliferation, organized crime and narcotics trafficking are seen as having increasing influence. The potential for nuclear, biological, or chemical (NBC) is a concern. Recent events make NBC emergencies a plausible scenario necessitating the detailed contingency planning and preparation of emergency responders to protect the civilian populace in Beverly Hills and in Los Angeles County.

HISTORY OF TERRORIST EVENTS IN BEVERLY HILLS

The City of Beverly Hills is an internationally known community with strong political and economic ties. Beverly Hills is frequently the focus of political events, dignitary visits, demonstrations and marches. It is routine for Heads of State to visit and conduct business within the City. These factors make Beverly Hills an attractive potential target. Acts of terrorism are not new to Beverly Hills. One need only recollect the turbulent times during the 1960's, 70's and 80's, which were noted for anti-war and anti-government incidents, which included marches, riots and bombings within the city limits. One such bombing occurred in June of 1978 at the Doheny Plaza Theater, directed against Palestinians. Another bombing occurred in June of 1980 at the House of Iran, which was an Iranian cultural center.

In the City of Beverly Hills, the Police Department shall be the lead agency for City

response/crisis management. The City's Office of Emergency Management is responsible for consequence management.

TERRORISM HAZARD IDENTIFICATION

Defining Terrorism

The United States Code defines terrorism as premeditated, politically motivated violence perpetrated against noncombatant targets by sub-national groups or clandestine agents usually intended to influence an audience. The United States Department of Justice defines terrorism as a violent act dangerous to human life, in violation of the criminal laws of the U.S. or any segment to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. The FBI defines terrorism as the unlawful use of force or violence against persons or property to intimidate or coerce government, the civilian population, or any segment thereof, in furtherance of political or social objectives. Terrorists are categorized based on their actions, not beliefs. Even if we have sympathy for their cause, they are still criminals.

All three of these definitions share important components: (1) criminal action; (2) the action must include violence against civilians; and (3) the action is carried out in order to further political or social objectives; and (4) the action is intended to coerce a government or civilian population.

Law enforcement has been able to categorize various terrorism groups. They are as follows:

→ Right Wing Terrorist Groups

Often engage in survivalist/ paramilitary training to ensure the survival of the U.S. as a white, Christian nation. Many extremists work through political involvement; however, some are members of the "militia" or "patriot" movement, and cannot work within existing structures of government. It is not illegal activity to belong to a militia. Many members of militias express that an impending armed conflict with the federal government necessitates paramilitary training and the stockpiling of weapons. The growth of the militia movement can be attributed to an effective communication system through the use of the Internet, videotape, gun shows, etc. Another phenomenon related to militias is "Common Law Courts."

→ Left-wing Terrorist Groups

Typically, left-wing groups profess a revolutionary socialist doctrine and view themselves as protectors of the American people against capitalism and imperialism. They believe that bombings alone will not result in change, but are tools to gain publicity for their cause.

→ Special Interest Terrorist Groups

Special interest terrorist groups differ from traditional right- and left-wing groups in that they pursue specific objectives. These terrorist groups attempt, through their violent criminal actions, to force members of society to change their attitudes about issues

considered important to them. Some special interest groups include animal rights activists, right to life groups, environmental preservation groups and abortion rights groups.

→ International Terrorist Groups
International terrorism against the U.S. is foreign based and/or directed by countries or groups outside the U.S. State sponsors view terrorism as a tool of foreign policy. State sponsors continue to engage in anti-Western terrorist activities by funding, organizing, networking, and providing other support to many extremists.

→ Formalized Terrorist Groups
Some terrorist groups are more formalized and are autonomous organizations with their own infrastructure, personnel, financial arrangements, and training facilities. Examples of such groups include: (1) Hezbollah; (2) Irish Republican Army and (3) Sikh

→ Loosely Affiliated International Radical Extremists
The last type of terrorist groups are loosely affiliated international radical extremists. Such groups are neither surrogates of, nor strongly influenced by any one nation. They can tap into a variety of official and private resource bases.

Weapons of Mass Destruction (WMD)
Terrorists could attack in different ways. Until very recently, no one seriously thought that weapons of mass destruction would ever be used against U.S. targets. Most law enforcement officers know very little about WMD. Law enforcement agencies with more immediate problems have had little time to prepare for a potential WMD attack. It is essential that law enforcement officers, who are likely to be first responders, become familiar with WMD. Additional training can occur once officers are aware of these WMD and how they can be used.

WMD can be categorized into five categories using the acronym B-NICE: Biological, nuclear, incendiary, chemical and explosive. The typical routes for exposure to the body include inhalation, ingestion, absorption and/or injection. Each category is further described below.

Biological
The four most common types of biological agents are bacteria, viruses, rickettsia, and toxins. These agents occur in nature, however they can be, and have been, produced by man for use as weapons.

Nuclear
Nuclear terrorism can occur in two different ways: either detonation or threat of detonation of a nuclear bomb; or dispersion of radiological material using a conventional explosive or other dispersal device.

Incendiary
An incendiary device is any mechanical, electrical, or chemical device used to intentionally initiate combustion and start a fire.

Chemical
Chemical agents can be classified into five categories: nerve agents, blister agents, blood agents, choking agents, and irritating agents. These agents are man-made.

Explosive
Explosive devices are the most common WMD (70% of all terrorist attacks). The Oklahoma City Federal Building bombing and the attack on the World Trade Center in New York are classic examples.

VULNERABILITY AND RISK ASSESSMENT

The probability that an individual/location will be targeted by a terrorist is a function of several factors: attractiveness of target, potential for success and potential for avoiding identification and capture. Some terrorists are willing to die for their cause and will select targets regardless of the probability of identification or capture. It is difficult to determine what individual or location will be targeted, however, law enforcement experts agree that a key element is "symbolism." The higher the profile of the target, the better in the terrorist mind. Examples include:

a. Federal, state, and local government buildings
b. Mass-transit facilities
c. Public buildings and assembly areas
d. Controversial businesses
e. Communication and utility facilities
f. Water supply locations
g. Research laboratories
h. Places where large groups of people congregate

It is not possible to estimate the probability of a terrorist attack. However, based on law enforcement's role in combating terrorism as indicated in the chart below, the City has identified critical sites and will assess the vulnerability of these sites to terrorist attack. As previously indicated, sites that are most likely to suffer the impact of terrorism include government facilities, such as City Hall, and entertainment and cultural facilities such as the business triangle, Rodeo Drive and the more popular hotels.

Law Enforcement Role in Combating Terrorism

A. On-going attention to known potential targets within the service area
B. Identification of new potential targets within the service area
C. Identification of suspicious persons, places, or things which may be related to potential terrorist activity
D. Recognition of potential surveillance and intelligence-gathering activities
E. Recognition of potential terrorist involvement in routine crimes (ID theft, shoplifting, credit card fraud, forgeries, etc.)
F. Organizing and informing community resources regarding anti- terrorism
G. Ability to respond safely and effectively to a terrorist incident or a terrorist use of a WMD.
H. Identify the Terrorist Group
I. Remove Financial Support
J. Monitor Weapons/Materials: No Weapons, No Attack Anywhere
K. Threat/Vulnerability Assessment
L. Counter Surveillance
M. Target Hardening
N. Awareness of Suspicious Behavior as Terrorists Egress From Target
O. Additional Indicators
--Equipment
--Training/Rehearsal Indicators
--General Indicators/Characteristics

WHAT IS SUSPECTIBLE TO TERRORISM

Damage caused by a terror attack depends on the method of attack. As the intensity of the attack increases, the potential for death and injuries, property damage or destruction and general chaos also increases.

EXISTING MITIGATION ACTIVITIES

Currently the City of Beverly Hills Police Department is implementing projects to help prevent a terrorist situation or be highly prepared if one were to occur. The following are practices or projects that are currently active in the city.

Intelligence

In July 2004 the Police Department created an intelligence unit as to have a full time intelligence detail team.

Community Education
Currently the Police Department along with the Office of Emergency Management is involved in conducting terrorism awareness programs for the community. This project has been going on since 2002. The goal of the project is to better inform the public on terrorist issues.

The Police
Department does this through community outreach such as coordinating Neighborhood Watch meetings and community programs.

Emergency Services Bureau
Created in March of 2004 the Police Department has created a Bureau with the Police Department to deal specifically with emergency services.

Explosive Sniffing Canine
Acquired in 2003, the City of Beverly Hills purchased a canine specifically trained to sniff out explosive materials. The Police Department is responsible for training and maintenance of the canine and its skills. The canine serves as a great asset to the community by possibly preventing the loss of life and property in the case of a bomb threat emergency.

TERRORISM MITIGATION STRATEGIES

Section 4 of this Plan contains a list of the Terrorism Mitigation Strategies.

SECTION 9

FLOOD

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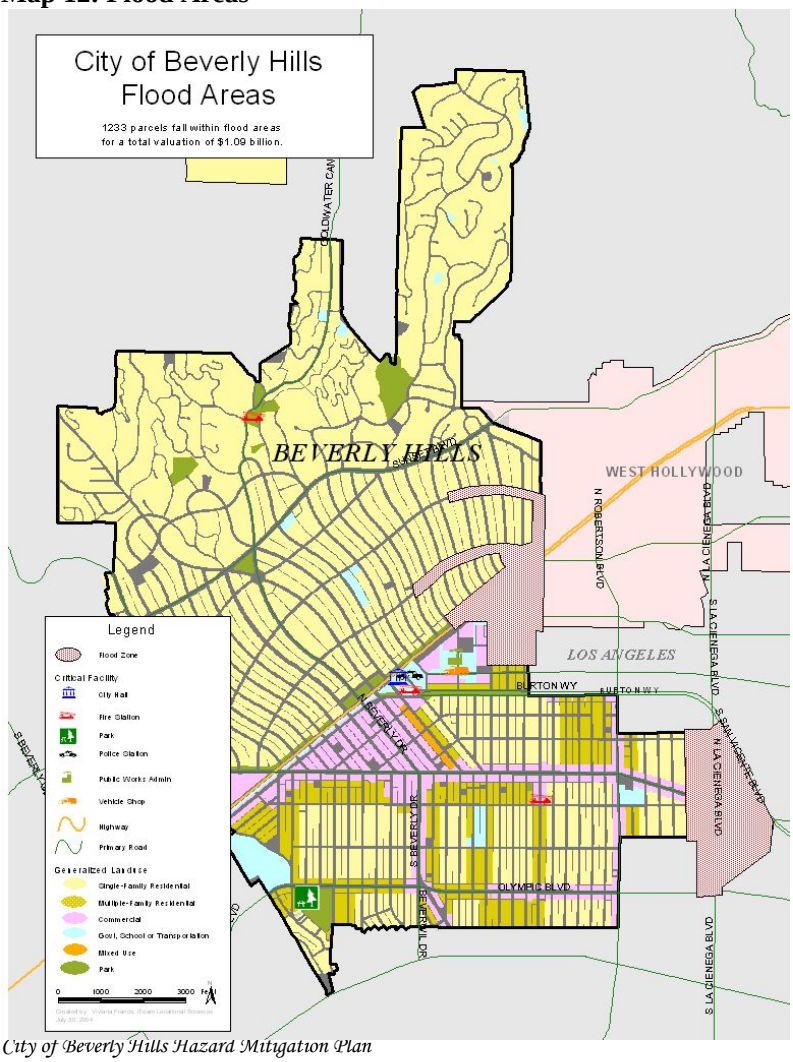
WHY ARE FLOODS A THREAT TO THE CITY OF BEVERLY HILLS

Flooding poses a threat to life and safety, and can cause severe damage to public and private property. Flooding events have occurred predominantly in the southeastern and northeastern sectors of the City, contiguous with the cities of Los Angeles and West Hollywood, respectively. The northeastern sector is bounded by Doheny Drive from Elevado Avenue 4to Third Street to the east, Santa Monica Boulevard and Civic Center Drive to the west. The southeastern sector is bounded by San Vicente Boulevard to the east, Burton Way/Clifton Way to the north, and La Cienega Boulevard to Olympic Boulevard to the south. This sector experienced a significant event in February 1978, causing the explosion of a natural gas service, loss of business and numerous flooding of multi- family residential and commercial properties with subterranean parking. Similar, but less severe flooding events occurred in 1980, 1992 and 1993.

Map 12: Flood Areas



The City of Beverly Hills was most recently affected by flooding in February 2003, causing flooding of subterranean garages, loss of personal property, including vehicles, and temporary loss of electric and gas service to the buildings in the 300 North Oakhurst Drive/Doheny Drive areas. Fortunately, none of flooding events in this city has had and significant long-term effects.

HISTORY OF FLOODING IN THE CITY OF BEVERLY HILLS AND THE LOS ANGELES AREA

The City of Beverly Hills, which is located within the Los Angeles Basin, has historically experienced flooding from major winter storm events. The City is at the southern edge of the Santa Monica Mountain range and approximately 12 miles east of the Pacific Ocean. Significant rainfalls typically drain quickly from the elevated areas northerly of and both in and outside the City are channeled through the regional Los Angeles County Flood Control System that traverses through the city.

Long-term precipitation (1950 – 2002) in this area is based on data collected and recorded by the Los Angeles County Department of Public Works (LACDPW) and the City's rain gauge station at City Hall. Annual precipitation ranges from a minimum of zero (recorded in 1989) to a maximum of 59.13 inches (1998 El Nino). Very little precipitation is recorded between the months of May and October although an average of 17.3 inches of rain is measured annually. Rain fall increases northward toward the Santa Monica Mountains to the north and northwest, and decreases toward the center of the Coastal Plain.

Historical annual precipitation and cumulative departure from mean annual precipitation for Beverly Hills demonstrate the severity and extent of dry and wet periods, the information below indicates five cyclical variations in the precipitation pattern between 1930 and 2003.

1. 1930 to 1976: a dry period
2. 1978 to 1983: an overall wet period
3. 1984 to 1990: a relatively dry period
4. 1991 to 1998: a relatively wet period
5. 1999 to present: beginning of a dry period

The City of Beverly Hills is part of the coastal plain of Los Angeles County. The majority of the surface area in Beverly Hills is completely urbanized restricting percolation of rain water into the ground. Mountain runoff flows from the base of the Santa Monica Mountains in a south, and southeasterly direction.

While the City of Beverly Hills is approximately ten miles west, of Los Angeles, it is not so far away as to not be affected by the 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 that pass through. Because the mountains are so steep, the rainwater moves rapidly down the slopes and across the coastal plains on its way to the ocean.

"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 Gabriel's receive more than forty inches of precipitation annually" **(29)**

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 or flood channel 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.

As described earlier, due to the close proximity to the Santa Monica Mountain range and the variations of typography ranging from an elevation of 250 feet to 1600 feet, flood waters have the potential to contribute to flooding hazards. Furthermore, due to continued growth, economic development and an increase of impermeable areas, the regions storm water collection and conveyance system were fast becoming incapable of safely disposing urban runoff. Thus, contributing to flooding conditions in the region and in particular, the flood zone areas earlier described in this section.

As a result of the need for flood control, the Los Angeles County Flood Control District was established in 1915. Currently, the Los Angeles County Flood Control District's Drainage Area flood control system is one of the world's largest and most extensive flood protection infrastructures. More recently, the system has undergone extensive upgrades and includes the recently completed construction of the Hollyhills Unit 7 Drainage System, a regional storm water conveyance system specifically constructed to replace the undersized drainage system that served both flood zone sectors of this city and contiguous areas of Los Angeles.

The Los Angeles County Department of Public Works will be performing an analysis of the Hollyhills Unit 7 drainage system, which potentially will redefine the flood zone, inundation area, susceptibility, and potential risk of flooding in this area

Another relatively regular source for heavy rainfall, particularly in the mountains and adjoining cities is from summer tropical storms. These tropical storms usually coincide with El Nino years.

El Nino is a disruption of the ocean-atmosphere system in the tropical Pacific having important consequences for weather in California. Among these consequences are increased rainfall across the southern tier of the US and Peru, which has caused destructive flooding and drought in the West Pacific. During El Nino, the trade winds

begin to relax in the central and western Pacific leading to a depression of the thermocline in the eastern Pacific and an elevation of the thermocline in the west. The result was a rise in sea surface temperature and a drastic decline in primary productivity, the latter of which adversely affected higher tropic levels of the food chain, including commercial fisheries as well. The weakening of the easterly trade winds during El Nino and the increase of rain fall follows the warm water eastwards, with associated flooding in the west. The eastward displacement of the atmospheric heat source overlaying the warmest water results in large changes in the global atmospheric circulation, which in turn forces changes in weather far removed from the tropical Pacific. December 1997 was near the peak of a strong El Nino year. There was also El Nino in 1991 – 1992, 1993-1994 and 1994-1995.

Flooding is often triggered by periods of short, heavy and intense rain fall. The majority of the surface area in Beverly Hills is completely urbanized, restricting percolation of rain water into the ground. Mountain runoff flows from the base of the Santa Monica Mountains in a southerly direction.

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.

Long-term annual precipitation
Two striking features of Los Angeles rainfall are its seasonal nature and its reflection of topographic effects.

Over the entire Los Angeles Basin, excluding mountain locations, the average annual precipitation ranges less than 12 inches at the immediate coast to more than 20 inches at the foothills. The normal seasonal rainfall measured at downtown Los Angeles is 15.14 inches.

On average, 92 percent of the seasonal precipitation falls between November 1st and April 30th. This percentage is roughly the same for all stations, regardless of elevation or distance from the ocean.

Seasonal rainfall variability was strongly demonstrated once again in Los Angeles during the 1998 calendar year. LAX received 352 % of normal rainfall within the first six months of 1998, but only 63% of normal in the second half of the year. The end of a very wet El Nino episode and the transition to a dry La Nina circulation was responsible for the change.

On a longer term, the 100- year change in rainfall rates within California in general and Los Angeles County in particular is practically nil: however, there was an apparent increase in the number of heavy precipitation in the last two decades of the twentieth century. From 1943 to 1992 (a period of almost fifty years) extreme rain falls occurred in southern California on only five occasions. This time span covered an era of incredible growth with the Los Angeles Basin and the concurrent flood control construction projects has tamed the flood-prone communities of Los Angeles . Heavy rainfall events were noted in the basin during the years 1992, '93, '95, '97, and '98 – helping to make the decade of the nineties the wettest since the 1930's and early "40s.

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" **(30)**. 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 City of Beverly Hills geologic features consists of mainly un-consolidated and semi-consolidated alluvial materials underlain and bounded on the north and east by consolidated sediments and crystalline rocks. The deposits consists of a shallow layer of Quaternary fill that has been washed down from the Santa Monica Mountains. The materials are generally poorly sorted sands and gravels, intermingled with silts and clays. The greater Los Angeles basin including this City is for all intents and purposes built out. This leaves precious little open land to absorb rainfall. This 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 replacing it with three or four town homes or apartments which 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.

HAZARD IDENTIFICATION

How are Flood-Prone Areas Identified?

A flood, as defined by the National Flood Insurance Program is: A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from: overflow of inland or tidal waters; unusual or rapid accumulation or runoff of surface waters from any source, or mudflow.

The standard for flooding is the so called "100 year flood" a benchmark used by the Federal Emergency Management Agency (FEMA) to establish a standard flood control throughout the country. Thus, the 100- year flood is also referred to as the regulatory or baseline for all flooding events.

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The National Flood Insurance Program (NFIP) was established by Congress in 1968 in response to the rising costs of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods. The Mitigation Division, a component of the Federal Emergency Management Agency manages the NFIP. The NFIP is self-supporting for the average historical loss year, which means that operating expenses and flood insurance claims are not paid for by the taxpayer, but through premiums collected for flood insurance policies. The Program has borrowing authority from the U.S. Treasury for times when losses are heavy, however these loans are back with interest.

The Program provides 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. 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.

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 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. 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. Man-made and natural changes to the environment have changed the dynamics of storm water run-off since then.

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.

Flood Areas in the City

FEMA has classified the City under Zone "C", which does not require mandatory flood mitigation enforcement. Properties are therefore not required to carry flood insurance.

Aside from FEMA's designation, the City of Beverly Hills has a local ordinance that restricts construction below the flood level in two areas. These areas are designated as "Flood Hazard Area" by the City and are prone to water intrusion**.**

The City of Beverly Hills is susceptible to flash or fast rise flooding because a high percentage of the surface area is composed of impervious streets, roofs, and parking lots. Flooding would tend to occur in the winter months. They can occur within several seconds to several hours, with little or no warning.

Urban flooding primarily affects the City of Beverly Hills. Flooding of areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's capability to remove it. These issues are addressed in the Storm Drain Master Plan. In addition, low- lying areas have the potential to flood.

The City has municipal codes that provides for the protection of residential and non-residential structures in Flood Hazard areas. Title 9, Chapter 7, Protection of Subterranean Construction from Water Intrusion provides provisions for floor levels and openings for residential and non-residential structures and protection of new and existing mechanical and electrical systems. This municipal code is supported by Ordinance 96-0-2269, adopted on November 15,1996, which provides a program to assist building owners in certain areas of the City, to identify and voluntarily mitigate potential hazardous conditions that may result in water intrusion from a 100 year storm. In addition, in Chapter 6, Article 3 is guidance for disaster repair and recovery

Storm Drain Master Plan
In November, 1999, the City performed a study titled "The City of Beverly Hills Storm Drain System Master Plan" that was prepared by Psomas Engineering, Inc. The purpose of the master plan was to provide a comprehensive drainage study to insure that changes in population density, land use and impervious surfaces have not caused deficiencies to develop. Furthermore, the hydrologic and hydraulic analysis was to identify and inventory existing storm drain facilities (streets, piping and structures) and those areas where deficiencies occurred, rank their severity, and provide opinions for system upgrades and recommend a Capitol Improvement Program (CIP) to initiate corrections.

Although a model of the City's drainage system was performed and identified deficiencies throughout the drainage system, most of the deficiencies were found to be attributed to two important factors. 1) Prior to 1980, when many of these drain were constructed, the Los Angeles County Flood Control District designed systems based on the use of 21% residential impervious factors. The Los Angeles County Department of Public Works has significantly increased this factor to 45%, essentially doubling the runoff flow; and 2) The Los Angeles County Modified Rational Method of Analysis is generally recognized as a conservative model that assumes worst case scenarios and predicts relatively high flows which may only marginally appear during actual events. Basically, the Modified Rational Method estimates runoff from approximate 40 acre areas, then integrates and routes the flows through the drainage system. It was prepared for 10-, 25-, and 100 year return interval storms.

This drain deficiency analysis was then used as a basis for formulation of a Capitol Improvement Program, prioritized based on the results of the Cost-to-Benefit Index, which assesses the relative benefit against the cost of replacing the deficient elements.

Dam and Reservoir Failure Flooding
In addition to flood hazard areas of the City that are prone to water intrusion, the City also has its own water system with its own reservoir. As with every city that has its own water system, there is the risk of a potential full or partial reservoir or dam failure. Loss of life and damage to structures, roads, and utilities may result from a reservoir or dam failure. Economic losses can also result from a lowered tax base and lack of utility profits. Several factors influence the severity of such an event: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

There have been a total of 45 reservoir failures in California, since the 19th century. **Chart 20** below shows significant reservoir failures in Southern California are summarized below.

Dam	Location	Year	Cause
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

Source: http://cee.engr.ucdavis.edu/faculty/lund/reservoirs/Reservoir_History_Page/Failures.htm

The two most significant reservoir failures in Los Angeles County are the St. Francis Reservoir in 1928, which killed over 500 people and caused damage estimates topped $20 million, and the Baldwin Hills Reservoir in 1963. Five people were killed. Sixty-five hillside houses were ripped apart, and 210 homes and apartments were damaged.

In the City of Beverly Hills, the Greystone Reservoir is considered by the State Department of Water Resources as a reservoir and dam. The drinking water reservoir is a concrete structure partially below ground with a capacity of 19 million gallons.

The Greystone Reservoir is located in the lower Trousdale Estates area, north of Sunset Boulevard. The reservoir was built in 1971 and is a concrete structure with a capacity of 19 million gallons of drinking water. If the reservoir were to fail, the escaping water would flow in a southerly direction. The inundation area would include Doheny Road and Foothill Road to the west, Doheny Drive to the east, Sunset Boulevard and Santa Monica Boulevard, the termination point, to the south.

The City also has a total of nine above and partially below-ground storage reservoirs. Some of these reservoirs are located in the proximity of residential structures, which could be adversely impacted by the discharge of escaping water, in the event of structural failure.

Because reservoir failure can have severe consequences, FEMA requires that all reservoir 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 reservoir owner. For more detailed information regarding reservoir failure flooding, and potential flood inundation zones, refer to the City of Beverly Hills' Disaster Plan.

In addition to the City's reservoir, the Upper and Lower Franklin Canyon Reservoir is located north of and adjacent to the Coldwater Canyon Park Recreational Center on North Beverly Drive. The Upper and Lower Franklin Canyon Reservoir is owned and operated by the City of Los Angeles. It was constructed in 1916 by William Mulholland.

The Lower reservoir was the primary storage facility. The Upper reservoir was built for stability of the lower one.

During the early 1940's, the Works Project Administration (WPA) constructed the earthen flood control dam. After the 1971 Sylmar earthquake, it was discovered that the two reservoirs could not safely contain the amount of water needed for the City of Los Angeles so they were placed out-of-service and a third reservoir constructed just north of the Lower reservoir. Presently, the Lower reservoir is used to detain flood waters and is a nature preserve.

In the event of a failure of the flood control dam, the escaping water would flow into the Higgins-Coldwater Channel. This below-ground concrete channel is located on the easterly side of Coldwater Canyon Drive, north of the City's fire station and the Coldwater Canyon Reservoir. The Higgin-Coldwater Canyon system was constructed in 1962 by the Corps of Engineers.

See the Dam and Reservoir Emergency Notification List, written by the City of Los Angeles Department of Water and Power for more information on the emergency procedures for this dam.

Debris Flows
Another type of flood-related hazard are debris flows. This is often referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast- moving landslides. Debris flows are discussed in Section 10 Earth Movements of this plan.

Floodplain
There are no specific floodplain areas in the City of Beverly Hills.

Floodway/Flood Channels
There are no floodways or above ground flood channels in the City of Beverly Hills. There are flood channels below ground that carry water from the storm drains. These channels are: Benedict Canyon Channel, Rexford Channel, West Hollywood Storm Drain and the Hollyhills Drain.

RISK ANALYSIS
Beverly Hills' risk analysis 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 Beverly Hills. However, the current mapping projects will result in better data that will assist in understanding risk.

WHAT IS SUSCEPTIBLE TO DAMAGE DURING A FLOOD EVENT

The largest impact on communities from flood events is the loss of life and property; In addition, other losses include vehicles in subterranean garages, loss of electrical and gas services, municipal services (i.e. water, wastewater, solid waste collection and disposal) and transportation.

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 and other infrastructure can be damaged when high waters combine with flood debris. Extensive damage can be caused by 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, appliances and vehicles parked in subterranean garages). As depicted in Map 12, 1233 parcels fall within flood areas for a total valuation of 1.09 billion dollars.

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. There has been no significant long term effect to the business and industry sector.

Public Infrastructure

Publicly owned facilities are a key component of daily life for all citizens of the City. Damage to public water and sewer systems, transportation networks, emergency facilities, and offices can hinder the ability of the government to deliver services. Previous mitigation measures have fixed many of the flooding problems to ground floor offices at City Hall and Parks and Recreational Centers.

The City's water distribution and the wastewater conveyance systems are maintained by city employees. During natural hazard events, or any type of emergency or disaster, dependable road connections are critical for providing emergency services. Roads systems in the City of Beverly Hills are also maintained by city employees.

Storm Water Systems

There is a drainage master plan, and City of Beverly Hills Public Works staff is aware of local drainage threats and deficiencies. 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. The City of Beverly Hills operates a wastewater collection system, which conveys the wastewater to a regional Wastewater Treatment Plant (Hyperion) that is owned and operated by the City of Los Angeles. The City of Beverly Hills wastewater is treated by this facility. The City of Beverly Hills also provides domestic drinking water to the residents as part of city services.

Water Quality problems include bacteria, toxins, and pollution. The City of Beverly Hills imports approximately 85 percent of its drinking water from the Metropolitan Water District of Southern California, The remaining 15 percent is produced locally from four municipal water wells and treated at a 3MGD water treatment plant that is owned and operated by Earth Tech, Inc. a subsidiary of Tyco International.

WHAT IS THE EFFECT OF DEVELOPMENT ON FLOODS

The City of Beverly Hills is highly urbanized and as a result of increased paving, can lead to an increase in volume and velocity of runoff after a rainfall event, exacerbating the potential flood hazards. Careful attention should be given to development in the flood areas to ensure that structures are prepared to withstand base flood events. Care should be taken in the development and implementation of storm water management systems to ensure that these runoff waters are dealt with effectively

EXISTING MITIGATION ACTIVITIES

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Beverly Hills.

- Routine inspection and cleaning of all storm water catch basins and culverts on a monthly maintenance schedule.

- Periodic inspection and cleaning of catch basins owned and operated by the Los Angeles Flood Control District in key locations within the City prior to storm events.

- Regularly schedule street cleaning to remove organic and non-organic debris from roadways to mitigate or reduce debris entering catch basins.

Furthermore, the City of Beverly Hills uses building codes, zoning codes, and various planning strategies to address development in areas of known hazards, and applying the appropriate safeguards.

Flood Management Projects

As described previously, the Los Angeles County, Department of Public Works Flood Control District has completed a massive storm water relief upgrade of the Holly Hills Unit 7 Drainage System in 2004. This project was designed specifically to negate the flooding conditions in the southeast sector of the cities of Beverly Hills and Los Angeles. The Los Angeles County, Department of Public Works Flood Control District was the lead agency for this project.

As a result of this capitol project, the Los Angeles County Flood Control District will be upgrading the floodplain maps to reflect this change in the near future.

Water Districts
The City of Beverly Hills continues to aggressively replace 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 Beverly Hills citizens. For example, the City of Beverly Hills has drinking water supply inter-ties with the City of Los Angeles, for emergency situations.

Wastewater Management
As describe previously, the City of Beverly Hills owns and operates a wastewater and storm water collection system. The wastewater and storm water collection system is maintained by City employees at regularly scheduled intervals. These intervals are increased during the fall and winter months, to mitigate the amount of leaves and other organic debris from entering into the storm water conveyance system and catch basins.

The City's wastewater is conveyed and treated at the City of Los Angeles' Hyperion Treatment Plant, which is a regional sewage treatment facility. The City's storm water collection system conveys urban and storm water runoff to a regional system owned and operated by the Los Angeles County, Department of Public Works Flood Control District. The receiving water body is the Ballona Creek, which terminates in Marina Del Ray and the Santa Monica Bay.

Stormwater 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 City of Beverly Hills is a Co-Permittee of the Los Angeles County, Waste Discharge Requirements for Municipal Urban and Stormwater Discharges and the Municipal National Pollution Discharge Elimination System (NPDES) Permit for Point and Non-Point source discharges. The City has in place a comprehensive program that includes enforcement of the requirements which are a part of the regional NPDES permit. The Program elements consist of: New Development Planning; New Construction and Grading Inspections; Best Management Practices; Industrial and Commercial Inspections; and Public Information and Outreach. Local authority to enforce the NPDES Permit was originally established in 1990 by the adoption of a Municipal Ordinance, followed by amendments resulting from Permit changes such as the Standard Urban Stormwater Mitigation Plan (SUSMP) as recently as calendar year 2000.

COMMUNITY ISSUES SUMMARY
The City of Beverly Hills works to mitigate problems regarding flood issues when they arise. Some areas in the City of Beverly Hills are more susceptible to flooding issues, and have incurred repetitive losses. With the completion of the Los Angeles County Flood Control District's Holly Hills Unit 7 Storm Drain Project, the City of Beverly Hills and

contiguous areas of the City of Los Angeles will no longer be susceptible to flooding conditions, flood related damages and loss of property.

FLOOD MITIGATION STRATEGIES

Section 4 contains the list of Flood Mitigation Strategies.

Section 10

EARTH MOVEMENT (LANDSLIDES)

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WHY ARE LANDSLIDES A THREAT TO THE CITY OF BEVERLY HILLS

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year **(31)**. The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually **(32)**. 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.

"A landslide is defined as, the movement of a mass of rock, debris, or earth flow 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." **(33)**.

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.

Landslides can be broken down into two categories: (1) slow moving; and (2) rapidly moving (generally known as debris flows). Slow moving landslides can cause significant property damage, but are less likely to result in serious human injuries. 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.

Landslides tend to 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. **(34)**.

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 **(36)**. This high rate of speed makes debris flows extremely dangerous to people and property in its path.

"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." **(35)**.

City of Beverly Hills is located between the Santa Monica Mountains and the coastal plain of the Los Angeles Basin. Majority of the City lies in a transitional area between the mountain and the coastal plain. The present of these distinct physiographic features provides considerable topographic relief. The lowest point within the City is approximately 120 feet above sea level located at Olympic and La Cienega Boulevards. The highest point of the City is approximately 1400 feet above sea level along Carla Ridge Drive in the Trousdale Estates area of the Santa Monica Mountain.

Topography of the City of Beverly Hills is greatly influenced by the Santa Monica Mountains and the Los Angeles Coastal Basin. Hillside areas north of Sunset Boulevard are characterized as rugged topography with steep sided ridges and narrow ravines and these areas have the highest potential of landslide. Areas south of Sunset Boulevard are flat with a mild slope approximately 2 to 3 percent in the south-southwest direction and these areas have little or no danger of landslide.

HISTORY OF LANDSLIDES

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. **(37)**. Debris flows normally occur when a landslide moves down slope 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. **(38)**. Flows often occur during heavy rainfall, can occur on gentle slopes, and can move rapidly for large distances.

Several slope failures have been reported in the northern hillside areas of the City. The major cause of the slope failures were reported to be heavy rainfalls and soil erosion. Also, the hillside residential development has placed additional loads on the subsurface bedrock which contributed to the slope failure. These failure planes are few feet deep and it extended through the soils overlaying bedrock. The reported slope failures occurred in the Santa Monica slate area that are characterized as having landslide potential due to the existence of bedding planes dipping out of the slope. No major lost of property or personal injury reported.

No significant or major debris flow resulted from landslide in the northern hillside area has been recorded in the City. Small debris flows in the City in the past have been localized and cleaned up by the City's Public Works crew. In the event of a major landslide in the hillside area, debris flow will destroy roadway pavement and fill the storm drain catch basins. Any significant surface movement along the streets that access Coldwater Canon Drive and Benedict Canon Drive will isolate residents in those areas.

HAZARD IDENTIFICATION

Identifying hazardous locations is an essential step towards implementing more informed mitigation activities. A geotechnical study was performed in 1987 by City's Geotechnical Engineering Consultant Woodward Clyde Consultants. Based on the ground shaking levels, soil characteristic, soil condition and the historical records of slope failures in the City, a Slope Instability Potential Map was developed. The hillside areas north of Sunset Boulevard and Trousdale Estate is classified respectively as high and moderate zone for potential landslide. Development in the hillside areas must comply with the Beverly Hills Building Codes requirements for slope stability. The remaining of the City is classified as low zone for potential landslide as shown in the potential instability map.

In addition to identifying the locations of where landslides may occur, other factors affect the likelihood of landslide incidents.

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. **(39)**.

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. 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:

1. On or close to steep hills;
2. Steep road-cuts or excavations;
3. 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);
4. Steep areas where surface runoff is channeled, such as below culverts, V -shaped valleys, canyon bottoms, and steep stream channels; and
5. Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons.
6. Canyon areas below hillside and mountains that have recently (within 1-6 years) been subjected to a wildland fire.

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.

Beverly Hills Building Department requires a geotechnical report for grading activities for the hillside developments. Grading plan is designed and certified by a licensed geotechnical engineer in accordance with the requirements of the Beverly Hills Building Codes. The site grading and excavation will be inspected by the Building Inspector during construction. Proper planning and geotechnical engineering will greatly reduce the potential for landslide and slope failure.

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. **(40)**.

The Beverly Hills Building Codes require drainage devices to dispose storm runoff from the hillside development. Ultimately the storm runoff is discharged into the City's storm drain system. City's storm drain catch basins are maintained by the Public Works Department and they were cleaned to prevent any flooding or ponding.

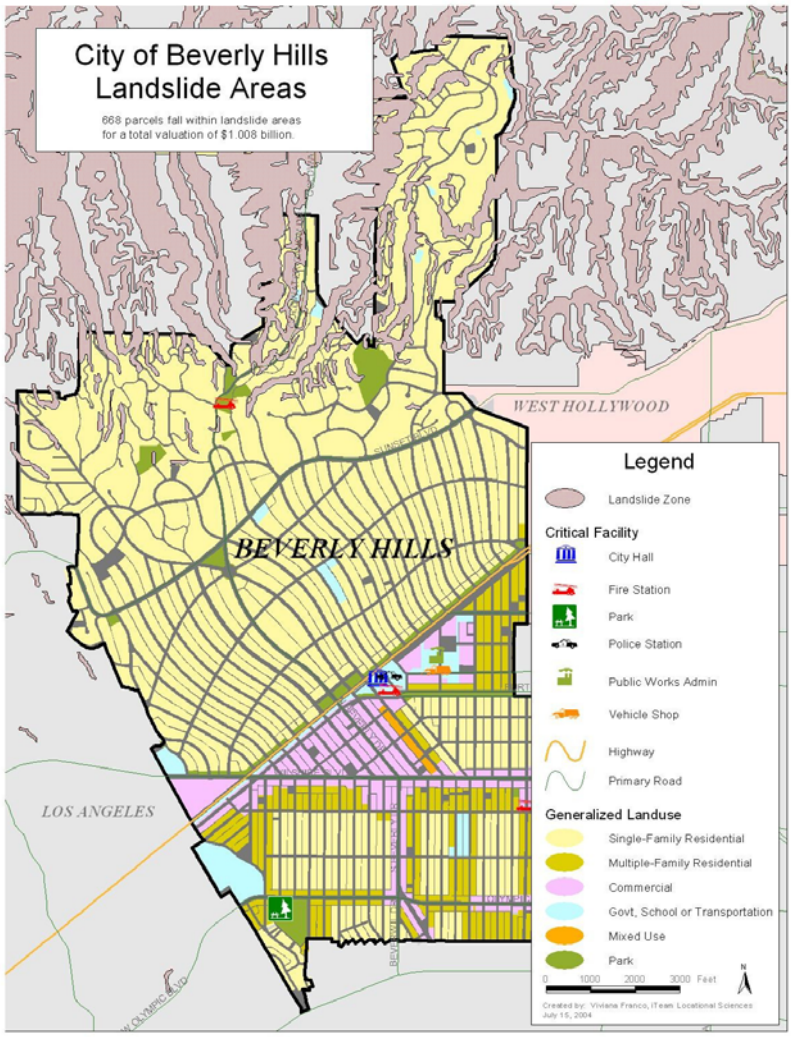
Changes in Vegetation
Removing vegetation from very steep slopes can increase landslide hazards. Areas that experience wildfire and land clearing for development may have long periods of increased landslide hazard. Also, certain types of ground cover have a much greater need for constant watering to remain green. Changing away from native ground cover plants may increase the risk of landslide.

RISK ANALYSIS
Vulnerability assessment for landslides will assist in predicting how different types of property and population groups will be affected by a hazard. **(41)**. 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 City of Beverly Hills Building Department uses the ratio of horizontal to vertical slope as an indicator of hill slope stability, using the ratio of 2 horizontal to 1 vertical as

the threshold to identify potentially unstable hillside slopes. The Slope Instability Potential Map shows the hillside areas north of Sunset Boulevard exceed the threshold limit. An estimated 20 % of the land in City of Beverly Hills exceeds this slope threshold and has potentially unstable soil.

Map 13: Landslide Areas



There are 666 parcels in Beverly Hills are located in the potential landslide area. The total value of these properties is estimated approximately $1.008 billons.

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 Beverly Hills 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 have caused major property damage or significantly impacted city residents, and continuing to map city landslide and debris flow areas will help in preventing 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.

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

The City of Beverly Hills Public Works Department, Street Maintenance Division is responsible to slides that inhibit the flow of traffic or are damaging the roadway. The Public Works Department does its best to communicate with residents impacted by landslides, but can usually only repair the roadway itself, as well as the areas adjacent to the slide where the city has the right of way.

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 landslide can be alleviated 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.

IMPACTS OF DEVELOPMENT

Although landslides are a natural occurrence, residential development can substantially affect the potential for landslide failures in City of Beverly Hills. Proper planning and geotechnical engineering can be exercised to reduce the threat of safety of people, property, and infrastructure.

EXISTING MITIGATION ACTIVITIES

Landslide mitigation activities include current mitigation programs and activities that are

being implemented by local or city organizations.

Landslide Building/Zoning Codes
The City of Beverly Hills Municipal Code (BHMC) Title 9 which adopted the Amendment of California Building Code (CBC) Chapters 18, 33 and 36 addresses development on hillside slopes. These sections outline standards for hillside slope hazard areas on slopes with a ratio of 2 horizontal to 1 vertical or less. Generally, the ordinance requires geotechnical engineering and geologic studies for developments proposed on slopes of 2 horizontal to 1 vertical or less. More detailed surface and subsurface investigations shall be warranted if indicated by geotechnical 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.

The CBC requires geotechnical investigation of the potential soil liquefaction and soil strength loss during earthquakes for development in the liquefaction zones. The geotechnical report shall address potential consequences of any liquefaction and soil strength loss and discuss mitigating measures.

LANDSLIDE MITIGATION STRATEGIES
The landslide mitigation action items provide direction on specific activities that the city, organizations, and residents in City of Beverly Hills 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. Section 4 contains the list of Landslide Mitigation Strategies.

SECTION 11

WINDSTORMS

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WHY ARE WINDSTORMS A THREAT TO THE CITY OF BEVERLY HILLS

Severe wind storms 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 have the potential to cause damage to local homes and businesses. High winds, over prolonged periods of time, can increase the risk of urban wildfire as moisture content decreases in brush on hillsides and at urban interface areas. High winds can displace or interrupt building structural elements, trees, electrical lines and other utility services.

CAUSES AND CHARACTERISTICS OF WINDSTORMS IN BEVERLY HILLS

High winds are generally related to thunderstorm activity, strong frontal systems or pressure gradient differences created at an interface of high and low pressure weather fronts. Most significant wind related events in the Southern California area are generally related to an anomaly termed "Santa Ana Winds". A technical description of the Santa Ana Wind condition can be accessed on a National Weather Service internet web site (http://nimbo.wrh.noaa.gov/Sandiego/snawind.html).

While Santa Ana wind conditions are indeed a concern for the general Southern California area (see chart 14), there seems to be a lack of correlation between the effects of these events in the Southern California area and significant effects of the same event in the City of Beverly Hills. Furthermore, the diverse topography within the City of Beverly Hills seems to favor isolated wind events whereas the hillside areas may be windy while, at the same time, the southern area of the City may remain calm.

Chart 21: Santa Ana Wind News Stories

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."

Comparing National Climatic Data Center (NCDC) records for thunderstorm/high wind events affecting Los Angeles County against available computerized tree maintenance records for City of Beverly Hills street trees (1999 to present), the affects of high wind events that have occurred across Los Angeles County seem to have little historic effect on Beverly Hills street trees (see chart 15). More specifically, the cross reference of NCDC records of fifteen (15) high wind events occurring between 1999 and 2003 against tree maintenance records for whole tree loss to wind during the same period show the loss of one (1) tree during a 29 November 1999 event and the loss of two (2) trees during a 6

January 2003 event. Therefore, it appears that wind related tree damage in the City of Beverly Hills does not appear to follow Los Angeles County weather event trends. Wind related tree damage is more likely to occur during events that are isolated specifically to the Beverly Hills area.

Chart 22: NCDC Records for Beverly Hills

Event Date	NWS Event Log	NWS Reported Wind speed (MPH)	Beverly Hills Event Related Impact
11-Feb-1999	NCDC: Event Details	74.88	None
3-Apr-1999	NCDC: Event Details	64.51	None
9-Apr-1999	NCDC: Event Details	46.08	None
21-Nov-1999	NCDC: Event Details	53.00	Windthrow of Ficus tree
2-Dec-1999	NCDC: Event Details	77.14	None
23-Feb-2000	NCDC: Event Details	57.60	None
5-Mar-2000	NCDC: Event Details	69.12	None
18-Apr-2000	NCDC: Event Details	100.22	None
28-Aug-2000	NCDC: Event Details	59.91	None
13-Feb-2001	NCDC: Event Details	51.84	None
20-Apr-2001	NCDC: Event Details	57.60	None
14-Dec-2001	NCDC: Event Details	52.00	None
13-Mar-2002	NCDC: Event Details	40.00	None
25-Nov-2002	NCDC: Event Details	80.64	None
6-Jan-2003	NCDC: Event Details	74.88	Windthrow of two (2) Pine trees

WINDSTORM HAZARD IDENTIFICATION

A windstorm event in the City of Beverly Hills can come in the form of short term, topographically influenced, high wind gusts to extended duration Santa Ana wind conditions. Significant wind events in the City of Beverly Hills could pose a significant concern to trees and structural elements of buildings, especially as wind thrown trees and detached structural elements block or disrupt roadways and utility delivery systems.

Chart 23: 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

In terms of City resources, trees come to mind as potential hazards during high wind events. The leafy canopy and structural elements of a tree crown present a drag type barrier to winds. Trees are naturally engineered to minimize wind drag through the re-orientation of leaves and through the independent motion of limbs and branches to minimize the transfer of uniform sway motion forces to the trunk during wind events. The Beaufort Wind Scale (BWS-see Chart 16) specifically notes problems with trees as

wind speeds increase. The BWS references the likelihood of whole tree motion as wind speeds exceed thirty two (32) miles per hour (MPH), twig breakage at thirty nine (39) MPH and whole tree windthrow as wind speeds exceed fifty five (55) MPH. The susceptibility of trees to windthrow can be influenced by the general structural condition of the trees, the location of the trees in reference to wind patterns and the level and frequency of pruning maintenance given the trees.

In the case of building structures, the likelihood of structural element detachment may be influenced by local construction code requirements, the location of buildings in reference to wind patterns and in the level of maintenance upkeep provided buildings by owners. Given the location of Beverly Hills in relation to historic Santa Ana wind flows, coupled with the topography of some areas of the City that favor the development of isolated high wind conditions; the effects of windstorms will be a continuing management concern in the City.

Using the analysis provided in the "Windstorm Characteristics in Beverly Hills" section, it can be assumed that windstorms will affect the Los Angeles area with some frequency, possibly annually. While the historic impact of these events on the City of Beverly Hills seems low, these events always stand to pose a threat to life, property, utility delivery systems, infrastructure elements and transportation. In the case that a wind event results in a major utility disruption, it may prove necessary to utilize private and City resources to aid in the care and sheltering of displaced residents. In the case of a severe event, the economic impact of providing these services on a long term basis could prove taxing. Additionally, the cost to restore disrupted or damaged City infrastructure or utility elements could be significant.

VULNERABILITY AND RISK

Historically, windblown debris liability claims in relation to trees are considered "acts of God" from a risk management perspective, unless a known condition existed that lent to an accident. In addition to a the rare frequency of this type of problem as seen in the previous analysis, The City of Beverly Hills has made no claim payments to address this type of problem.

The level of expenditures for all emergency type tree services (i.e. limb failures, clearance of private property tree failures into roadways, etc.) has decreased over the past few years from two (2) percent of the total funding availability to a current level of less than one (1) percent. As the previous analysis showed, few of the responses are directly related to wind events.

In regards to wind related damage to City structures; the City has no record of claim payments related to structural damage during windstorms during the last decade.

In summary, historical data suggests that the vulnerability and risk levels for windstorm related damage and liability in the City of Beverly Hills is low.

WHAT IS SUSCEPTIBLE TO WINDSTORMS

Life and Property

Based on the known wind patterns in the Los Angeles area, windstorms can be expected. As wind speeds increase, the likelihood that trees will be uprooted, building structural elements torn away and utility delivery elements damaged. Detached tree limbs and building elements present a significant hazard to life. As large trees are uprooted, the likelihood that loss of life or significant damage to structures and vehicles will occur increases dramatically.

Utilities and infrastructure

Many times, when power poles and lines fall to the ground, it is because a tree has fallen across the lines. Live power lines on the ground can pose a deadly electrical shock hazard to pedestrians or people trapped in vehicles. Displaced tree limbs or flying structural debris can cause power line arching and subsequent utility delivery disruptions. Windstorms can cause structural damage to buildings and other critical infrastructure, especially as trees are wind thrown. With this damage comes the potential for disruption of communications and technological systems, especially as disruption timeframes become lengthy.

Transportation

Windblown debris, tree limbs and wind thrown trees can damage traffic control apparatus, block roadways, damage vehicles and limit the accessibility of emergency vehicles. Power lines that have been knocked down by falling trees create the potential for fire and electrocution hazards.

Increased Fire Threat

Prolonged winds during the warmer months of the year can decrease foliar moisture levels and increase the ignition potential in drying underbrush. When urban/wildland interface fires occur, Santa Ana wind conditions can drive the flames and increase the spread speed and severity of the fire. This is a concern near homes, especially where brush clearance has been lax.

EXISTING MITIGATION ACTIVITIES

Tree Management

In terms of limiting the potential impact of high wind events on trees, routine trimming to promote air flow through tree crowns and elimination of structurally questionable trees are prudent focuses.

As a Tree City USA program participant, the City of Beverly Hills is recognized for a well rounded urban forestry program. This program includes the scheduled maintenance pruning of trees, the identification and master planned removal and replacement of declining segments of the urban forest and public education programs. Current programs that address limiting decline and potential dangers in the City of Beverly Hills urban forest include:

Street Tree Master Plan (STMP) Phase One (1)
The removal and replacement of approximately three thousand (3000) American Elm (Ulmus Americana) and Arizona Ash (Fraxinus velutina) trees, affecting thirty (30) streets in the City was outlined in the STMP Phase One (1) of 1996. In addition to overall decline problems, many of these trees displayed structural abnormalities that could become failure potentials during high wind events. The removal and replacement of approximately two hundred (200) trees each year under this program serves to eliminate structurally deficient trees from the population, thus reducing the overall failure potential of trees in the overall tree population. The program will be approximately fifty (50) percent complete at the end of fiscal year 2003-2004. In addition to the phased removal and replacement program activities, remaining American Elm and Arizona Ash trees are inspected each year during a safety and clearance pruning cycle.

Street Tree Master Plan Phase Two (2)
An ongoing program, Phase Two (2) of the STMP addresses problems with Indian Laurel Fig (Ficus microphylla "Nitida") trees in the City. Ficus trees, for the most part, are fast growing trees with an aggressive root system. As roots from Ficus trees cause conflict with sidewalks and curbs, it becomes necessary to cut roots. When severe root cutting is necessary, tree stability can become an issue. Prior to the development of Phase Two (2) of the STMP, the City attempted to maintain some equilibrium between the crowns of trees that had suffered root cutting and the root system keeping these trees in place through an aggressive and short phased trim cycle. This approach sapped resources from other portions of the urban forest, as approximately thirty (30) percent of the available annual pruning budget was spent pruning Ficus trees that represent approximately six (6) percent of the total City tree resource.

At present, STMP Phase Two (2) projects have decreased the Ficus tree population in the Business Triangle of the City, along Lasky Drive, Durant Drive and Olympic Boulevard. Future STMP Phase Two projects will include the review of Ficus trees on Robertson and La Cienega Boulevards, as well as a portion of Santa Monica Boulevard to the west of Wilshire Boulevard. With the continuation of this program, potentially unstable Ficus trees will be eliminated from the population. Replacement trees will offer the benefits of being more site and size appropriate in addition to being more structurally stable.

Ongoing assessment and protection of the City tree resource
The computerized inventory of the City of Beverly Hills urban forest resource includes a simple data set for individual tree attributes and locations. The ongoing assessment of this inventory identifies increasing attrition rates in segments of the tree population not addressed by a STMP phase. Any notable increase in tree attrition is investigated and analyzed. Individual trees that are potentially dangerous are identified during tree maintenance activities and through reports originating from both City staff and residents.

Community partnership
The City of Beverly Hills encourages partnership in the care of the City tree resource by providing public education materials to residents and their gardeners in the proper care of City trees, especially when attrition rate trends are noted in a particular segment of the

urban forest. This material is mailed with tree trimming notifications and is available for viewing and download on the City web site.

Care of City Parkway Trees
The City takes an aggressive approach towards the protection of parkway trees that may be impacted by construction activities. Construction personnel and property owners are provided with guidelines for the protection of City trees during construction projects. In the event that guidelines are not followed, the City takes whatever action is necessary to see to the protection of trees. When a tree is given proper attention and care, the likelihood that the tree will become diseased or structurally unstable decreases. This material is provided during the project planning process, distributed by inspectors in the field and is available for viewing and download on the City web site.

Protecting Parkway Trees during Construction
Program successes and challenges:
The level of expenditures for all emergency type tree services (i.e. limb failures, clearance of private property tree failures into roadways, etc.) has decreased over the past few years from two (2) percent of the total funding availability to a current level of less than one (1) percent. As the previous analysis showed, few of the responses are directly related to wind events.

The continued improvement in community partnership related to the care of City parkway trees is expected to have a significant impact in limiting avoidable decline and attrition in the street tree population.

As private property tree maintenance improves, especially in the hillside areas of the City, the occurrence of wind and rain related tree failures into public roadways is expected to decline.

EXISTING WINDSTORM MITIGATION ACTIVITIES – INTERAGENCY EFFORTS

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, 37, 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 assists the power company in preventing future tree failure. From the collection of this data, the power company can advise residents as to the most appropriate vegetative planting and pruning procedures. The following chart depicts some of the tree failure data collected by Southern California Edison in this comprehensive mitigation strategy:

WINDSTORM MITIGATION STRATEGIES
The windstorm mitigation action items provide direction on specific activities that organizations and residents in City of Beverly Hills 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.
(See Section 4 for list of Windstorm Mitigation Strategies)

APPENDIX A

PLAN RESOURCE DIRECTORY

EARTHQUAKE

Local and regional Resources

Los Angeles County Public Works Department
900 S. Freemont Ave.
Alhambra, CA 91803
626-458-5100
http://ladpw.org

Southern California Earthquake Center (SCEC)
3651 Trousdale Parkway
Los Angeles, CA. 90089
213-740-5843
www.scec.org

State Resources

California Department of Transportation (CalTrans)
120 S. Spring Street
Los Angeles, CA. 90012
213-897-3656
http://www.dot.ca.gov/

California Resources Agency
1416 Ninth Street
Sacramento, CA. 95814
916-653-5656
http://resources.ca.gov/

California Division of Mines and Geology (DMG)
801 K Street
Sacramento, CA. 95814
916-4451825
www.consrv.ca.gov/cgs/index.htm

California Department of Conservation: Southern California Regional Office
655 S. Hope Street
Los Angeles, CA 90017
Ph: 213-239-0878
www.consrv.ca.gov

Governor's Office of Emergency Services (OES)
P.O. Box 419047
Rancho Cordova, CA 95741-9047
Ph: 916 845- 8911
www.oes.ca.gov

Federal and National Resources

Building Seismic Safety Council (BSSC)
1090 Vermont Ave., NW
Washington, DC 20005
Ph: 202-289-7800]
www.bssconline.org

Federal Emergency Management Agency, Region IX
1111 Broadway
Oakland, CA 94607
Ph: 510-627-7100
www.fema.gov

Federal Emergency Management Agency, Mitigation Division
500 C Street, S.W.
Washington, D.C. 20472
Ph: 202-566-1600
www.fema.gov/fima/planhowto.shtm

United States Geological Survey
345 Middlefield Road
Menlo Park, CA 94025
Ph: 650-853-8300
http://www.usgs.gov/

Western States Seismic Policy Council (WSSPC)
125 California Avenue
Palo Alto, CA 94306
Ph: 650-330-1101
www.wsspc.org/home.html

Institute for Business & Home Safety
4775 E. Fowler Avenue
Tampa, FL 33617
Ph: 813-286-3400
http://www.ibhs.org/

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.

FIRE

Regional 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

The following are a list of federal resources available to the City of Beverly Hills:
Federal Emergency Management Agency (FEMA) Programs:

Fire Suppression Assistance Grants
Hazard Mitigation Grant Program
National Wildland/Urban Interface Fire Protection Program
Federal Wildland Fire Policy, Wildland/Urban Interface Protection
http://www.fs.fed.us/land/wdfire7c.htm

National Fire Protection Association (NFPA)
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)
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)
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
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.C.
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.
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. C.
Firewise (NFPA Public Fire Protection Division)
Phone: (617) 984-7486
http://www.firewise.org

TERRORISM

Local Resources

Beverly Hills Police Department
464 N. Rexford Dr.
Beverly Hills, CA 90210
(310) 550-4951

Los Angeles Sheriff's Department
4700 Ramona Blvd.
Monterey Park, CA 91754
(323) 526-5541

State Resources

Office of Emergency Services
www.oes.ca.gov

Federal and National Resources

Department of Homeland Security
www.dhs.gov

The National Disaster Communication Response Team
www.ndcrt.org/alphabetical.html

Federal Bureau of Investigation
www.fbi.gov

FLOOD

County Resources

Los Angeles County Public Works Department
900 S. Fremont Ave.
Alhambra, 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 419047Rancho Cordova, CA 95741
Ph: 916 845- 8911
Fax: 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
Fax: 213-239-0984

Federal Resources and Programs

Federal Emergency Management Agency (FEMA)
Federal Emergency Management Agency, Region IX1111
Broadway, Suite 1200 Oakland, CA 94607
Ph: 510-627-7100
Fax: 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 Beverly Hills is (or 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 (Fans) about the Website, and a catalog of Web links.

P.O. Box 50891
Sparks, NV 89435-0891
Ph: 775-626-6389
Fax: 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 Beverly Hills. National Weather Service
520 North Eleven 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.

1325 East West Highway, SSMC2
Silver Spring, MD 20910
Ph: 301-713-1658
Fax: 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.

14th and Independence Ave., SW, Room 5105-A
Washington, DC 20250
Ph: 202-720-7246
Fax: 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.

6000 J Street Placer Hall
Sacramento, CA 95819-6129
Ph: 916-278-3000
Fax: 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 Natural Resources

American Public Works Association
2345 Grand Boulevard, Suite 500
Kansas City, MO 64108-2641
Ph: 816-472-6100
Fax: 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 reservoirs, 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

LANDSLIDE

County Resource

Los Angeles County Department of Public Works
900 S. Freemont Ave.
Alhambra, CA 91803
626-458-5100
http://ladpw.org

State Resources

- Department of Conservation Headquarters
- California Geological Survey Headquarters/Office of the State Geologist
- California Division of Forestry
- Department of Water Resources
- Governor's Office of Emergency Services
- California Department of Transportation (Cal Trans)

Federal Resources

- Federal Emergency Management Agency (FEMA)
- Natural Resource Conservation Service (NRCS)
- US Geological Survey, National Landslide Information Center

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.

WINDSTORMS

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

City of Beverly Hills: Property Owner's Guide to Protecting Street Trees:
http://www.beverlyhills.org/presence/connect/CoBH/Homepage/For+Residents/City+Services/Trees/RESRP- COPY-Protecting_Trees_English

City of Beverly Hills: Protecting City Parkway Trees During Private Property Construction:
http://www.beverlyhills.org/presence/resources/file/eb00030cb234c06/treesprotection.pdf

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:
http://www.chubb.com/personal/html/helpful_tips_home_windstorm.html

APPENDIX B

Hazard Mitigation Plan Endnotes

1. US Census Data as of July 1, 2002

2. Source: City of Beverly Hills Website 2004

3. City of Beverly Hills General Plan Briefing Book – Beverly Hills Today, p. 4.

4. Los Angeles Almanac, 2002 Data

5. Draft Mobility Plan October 2003 prepared by Kaku

6. SCAG figures quoted on p. 4 of Beverly Hills GP briefing book – "Beverly Hills Today."

7. City of Beverly Hills Housing Element 1998-2005

8. City of Beverly Hills Housing Element 1998-2005 (pp. 7-8)

9. Risk Management Solutions

10. Melvyn Green Report May 2004 (Attachment I)

11. Valuation calculation was derived as follows: square footage of existing buildings (based on the most current Los Angeles County Assessor Data for square footage) x $150/s.f. replacement cost. Replacement cost was provided in addition to the assessor's valuation due to fluctuations in real estate prices. While $150/s.f. is a reasonable assumption for construction costs, many buildings in Beverly Hills have a sq. ft. construction cost of $400 or more. **(Note: This Valuation estimate is for improvements only and does not include land value.)**

12. xiv Average number of persons per unit based on 2000 U.S. Census (2.73 average household size for owner-occupied units)

13. Planning for Natural Hazards: The California Technical Resource Guide, Department of Land Conservation and Development (July 2000)

14. http://www.consrv.ca.gov/CGS/rghm/ap/

15. Ibid

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

17. FEMA HAZUS http://www.fema.gov/hazus/hazus2.htm (May 2001).

18. http://www.chamber101.com/programs_committee/natural_disasters/DisasterPreparedness/Forty.htm

19. http://www.fire.ca.gov/php/2003fireseasonstats_v2.asp

20. http://www.fire.ca.gov/php/fire_er_content/downloads/2003LargeFires.pdf

21. http://www.usgs.gov/public/press/public_affairs/press_releases/pr1805m.html

22. http://www.nifc.gov/stats/wildlandfirestats.html

23. http://research.yale.edu/gisf/assets/pdf/ppf/wildfire_report.pdf

24. Planning for Natural Hazards: The Oregon Technical Resource Guide, (July 2000) Department of Land Conservation and Development

25. Planning for Natural Hazards: The Oregon Technical Resource Guide, (July 2000), Department of Land Conservation and Development

26. http://www.eqe.com/publications/revf93/firefoll.htm

27. Source: National Interagency Fire Center, Boise ID and California Division of Forestry, Riverside Fire Lab.

28. http://www.fs.fed.us/land/wdfire7c.htm

29. Gumprecht, Blake, 1999, Johns Hopkins University Press, Baltimore, MD.

30. Ibid

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

32. 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., Rotterdam: Balkema.

33. Landslide Hazards, U.S. Geological Survey Fact Sheet 0071-00, Version 1.0, U.S. Department of the Interior - U.S. Geological Survey, http://pubs.usgs.gov/fs/fs-0071-00/

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

35. Ibid.

36. Barrows, Alan and Smith, Ted, DMG Note 13,
http://www.consrv.ca.gov/cgs/information/publications/cgs_notes/note_33/

37. Robert Olson Associates, Metro Regional Hazard Mitigation and Planning Guide (June 1999) Metro

38. Ibid.

39. Planning For Natural Hazards: The Oregon Technical Resource Guide, Department of Land Conservation and Development (2000), Ch 5.

40. Homeowners Guide for Landslide Control, Hillside Flooding, Debris Flows, Soil Erosion, (March 1997)

41. Burby, R. (Ed.) Cooperating With Nature (1998) Washington, D.C.: Joseph Henry Press.

APPENDIX C

Local Hazard Mitigation Plan Review

APPENDIX D

Natural Hazard Risk Analysis Rating Form

This form was used to assess risk of each hazard in Beverly Hills.

DMA 2000 Hazard Mitigation Plan
Natural Hazard Risk Analysis Rating Form
City of Beverly Hills 2004

INSTRUCTIONS FOR HAZARD MITIGATION RATING FORM

Give each hazard priority risk category listed as a rating from 0 to 3; 0 = no risk, 3 meaning a high risk.

0 = No hazard risk in accordance with the definitions for hazard prioritization on page 3 through 5 of this form.

1 = Low Risk in accordance with the hazard prioritization definitions on pages 3 through 5 of this form.

2 = Moderate Risk in accordance with the hazard definitions on pages 3 through 5 of this form.

3 = High Risk in accordance with the hazard risk definitions on pages 3 though 5 of this form.

Total the numbers horizontally for each hazard category. The highest possible score for a hazard is 24; the lowest potential score is 0.

After the completion of the matrix, the committee will assign the numerical values for the four categories of risk: 1-highest priority risks, 2-moderate priority risks, 3-low risk priority risks and 0-no risk rating values for prioritization.

Examples: A score of 17 to 24 could be considered high-priority risk
9 to 16 could be considered moderate-priority risk
0 to 8 could be considered low-priority risk

Hazard	Magnitude	Duration	Distribution	Area Affected	Frequency	Probability	Degree of Vulnerability	Community Priority	Value
Earthquake									
Fire: Wildland/Urban									
Flood									
Landslide/Mudslides									
Windstorms									
Terrorism									
Power Outages									

DMA 2000 Hazard Mitigation Plan
Natural Hazard Risk Analysis Rating Form
City of Beverly Hills 2004

DEFINITIONS FOR HAZARD PRIORITIZATION

Magnitude

Physical and economic greatness (impact) of the event

Factors to consider

- Size of event
- Threat to life
- Threat to Property
    1. Individual
    2. Public sector
    3. Business and manufacturing
    4. Tourism

Duration

The length of time the disaster and the effects of the disaster last

Factors to consider

- Length of physical duration during emergency phase
- Length of threat to life and property
- Length of physical duration during recovery phase
- Length of effects on individual citizen and community recovery
- Length of effects on economic recovery, tax base, business and manufacturing recovery, tourism, threat to tax base and threat to employment

Distribution

The depth of the effects among all sectors of the community and State

Factors to consider:

- How wide spread across the state and community are the effects of the disaster
- Are all sectors of the community affected equally or disproportionately

Area Affected

How large an area is physically threatened and potentially impaired or by a disaster risk

Factors to consider:

- Geographic area affected by primary event

- Geographic, physical, economic areas affected by primary risk and the potential secondary effects.

Frequency

The historic and predicted rate of recurrence of a risk caused event (generally expressed in years such as the 100 year flood)

Factors to consider:

- Historic events and recurrences of events in a measured time frame
- Scientifically based predictions of an occurrence of an event in a given period of time.

Degree of Vulnerability

How susceptible is the population, community infrastructure and state resources to the effects of the risk.

Factors to Consider:

- History of the impact of similar events
- Mitigation steps taken to lessen impact
- Community and State preparedness to respond to and recover from the event

Community Priorities

The importance placed on a particular risk by the citizens and their elected officials:

- Willingness to prepare for and respond to a particular risk
- More widespread concerns over a particular risk then other risks
- Cultural significance of the threat and associated a risks
- Opportunity to mitigate for one risk before others due to resource availability
- Distribution of resources

Appendix E

Planning Meetings

The following is a list of internal Hazard Mitigation Planning Meetings conducted throughout the course of ten months:

Steering Committee Meeting
9/20/2004
Description: Reviewed and approved mitigation overview chart and strategies. Reviewed and approved hazard strategies. Chose the best prioritization/analysis.
Attendees: Mahdi Aluzri, Pamela Mottice Muller, Joe Lombardi, Vincent Chee, Steve Miller, Don Oblander, Keone Kali, Chris Theisen
Location:
City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Steering Committee Meeting
7/22/2004
Description: Approve ranking and review/ approve council update memo.
Attendees: Mahdi Aluzri, Pamela Mottice-Muller, Chief Pete Bonano, Capt. Salcido, David Gustavson, Rob Beste, Steve Miller, Maria Rychlicki, Julie Kahn, Don Oblander.
Location:
City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Fire Department Planning Meeting
7/15/2004
Description: Meeting to discuss revisions and additions to Fire portion of the Hazards mitigation Plan
Attendees: Capt. Steve Vance, Pamela Mottice-Muller, Viviana Franco
Location:
Public Works Department, 345 Foothill Road
Beverly Hills, CA 90210

Hazard Mitigation Plan: Project Coordinator
7/15/2004
Description: Meeting to provide update and input on the progress of the plan.
Attendees: Sam Lee, Bob Cavaglieri, Capt. Steve Vance, Vincent Chi, Ed Otsuka, Ken Pfalzgrag, Officer Ron Derderian, Lt. Lombardi, Donna Jerex, Danny Castro, Audrey Arlington, Maria Rychlicki, Julie Kahn, David Schirmer, and Roxanne Diaz.
Location:
Public Works Department, 345 Foothill Road
Beverly Hills, CA 90210

Infrastructure and Critical Facility Meeting

6/10/2004
Description: Defined critical facilities. Public Works will have responsibility for the completion of this section.
Attendees: Sam Lee, Vincent Chee, Ed Otsuka, and Pamela Mottice-Muller.
Location:
Public Works Conference Room, 345 Foothill Rd.
Beverly Hills, CA 90210

Hazard Mitigation Plan: Project Coordinator Meeting
6/7/2004
Description: Public meeting to review department progress in writing plan.
Attendees: Sam Lee, Capt. Vance, Ed Otsuka, Ron Derderian, Lt. Lombardi, Donna Jerex, Julie Kahn, and Pamela Mottice-Muller.
Location:
Public Works Conference Room

Hazard Mitigation Plan: Police Department Meeting
6/3/2004
Description: Meeting to discuss Police/Terrorism portion of plan.
Attendees: Lt. Joe Lombardi, Officer Ron Derderian
Location:
Police Department, 464 N. Rexford Dr.
Beverly Hills, CA 90210

Community Process Meeting
6/2/2004
Description: City Hall Planning Dept. reviewed community profile portion of the plan. Discussed where info will be gathered and the plan format for this portion.
Attendees: Donna Jerex and Pamela Mottice-Muller.
Location:
City Hall Planning Department, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Multi jurisdictional Planning Area A Meeting
5/27/2004
Description: Area A, Santa Monica, West Hollywood, Culver City, and Beverly Hills meeting to compare progress of plans in each city.
Attendees: representatives from Area A cities
Location:
Public Works Building, 345 Foothill Rd.
Beverly Hills, CA 90210

Fire Planning Meeting
5/18/2004
Description: Meeting to discus Mitigation Plan
Attendees: Chief Bonano, Chief Cavaglieri, Captain Vance.

Location:
Public Works, 345 Foothill Rd.
Beverly Hills, CA 90210

Hazard Mitigation Plan: Project Coordinator Meeting
5/17/2004
Description: Meeting to provide update and input on the progress of the plan.
Attendees: Sam Lee, Bob Cavaglieri , Vincent Chee, Ed Otsuka, Ken Pfalzgrag, Lt. Lombardi, Donna Jerex, Maria Rychlicki, Julie Kahn, David Schirmer.
Location:
Public Works Conference Room, 345 Foothill Rd., Beverly Hills CA, 90210

Hazard Mitigation Plan: Police Department Meeting
5/13/2004
Description: Police/Terrorism planning meeting.
Attendees: Lt. Joe Lombardi, Officer Ron Derderian
Location:
Police Department, 464 N. Rexford Dr.
Beverly Hills, CA 90210

Fire Department Hazard Mitigation Meeting
5/12/2004
Description: Discussed completion of fire portion of plan (wildland fire and fire)
Attendees: Chief Robert Cavaglieri and Capt. Steven Vance, Pamela Mottice-Muller
Location:
OEM office, 345 Foothill Rd.
Beverly Hills, CA 90210

Planning Strategy Meeting
4/22/2004
Description: Discussed timeline development and developed new strategy for completion of plan.
Attendees: Mahdi Aluzri and Pamela Mottice-Muller.
Location:
City Hall Planning Dept., 455 N. Rexford Dr.
Beverly Hills, CA 90210

Hazard Mitigation Plan: Steering Committee Meeting
4/21/2004
Description: Reviewed and approved plan goals. Discussed hazard analysis and estimate losses.
Attendees: Mahdi Aluzri, Pamela Mottice Muller, Chief Pete Bonano, Capt. Curtis, David Gustavson, Rob Beste, Pat Agnitoh, Julie Kahn, Keone Kali.
Location:
City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Hazard Mitigation School Planning Meeting
4/1/2004
Description: Review of Plan and Planning Process. Discussion if school and city should have separate plan
Attendees: Gary Mortimer (School District), Maria Rychlicki, Julie Kahn
Location:
Public Works Building, 345 Foothill Rd.
Beverly Hills, CA 90210

Recreation and Parks Department Staff meeting
3/30/2004
Description: Discussed department responsibilities/strategies in development of wind section of Hazard Mitigation Plan.
Attendees: Department management staff
Location:
455 N. Rexford Drive, Room 100
Beverly Hills, CA 90210

Hazard Mitigation Plan Steering Committee Meeting
3/24/2004
Description:
Attendees - Ken Pfalzgrag (for Steve Miller), David Gustavson, Keone Kali, Mahdi Aluzri, Tony Dahlerbruch, Donna Jerex, Cindy Aller-Sterling (for Don Oblander), Julie Kahn, Bob Cavaglieri (for Pete Bonano), Ron Derderian, Rob Beste, Bob Curtis (for Chief Snowden)
Location:
City Hall, 455 N. Rexford
Beverly Hills, CA 90210

Multi-Jurisdictional Planning Meeting: Los Angeles County
3/22/2004
Description: Meeting with County Representatives and other cities to discuss Hazard Mitigation Plan Draft.
Attendees: County Representatives and other city representatives
Location: Los Angeles Emergency Operations Center
1275 N. Eastern Ave.
Los Angeles, CA 90063

Recreation and Parks Department Planning Meeting
3/22/2004
Description: Department meeting on baseline data collected.
Attendees: Steve Miller, Ken Pfalzgraf
Location:
455 N. Rexford, Room 100
Beverly Hills, CA 90210

Background Briefing Session
3/18/2004
Description: discuss background info/requirements for upcoming 3/24/04 meeting.
Attendees: Pam Mottice-Muller, Sam Lee, Donna Jerex
Location:
Public Works Building, 345 Foothill Rd.
Beverly Hills, CA 90210

Multi Jurisdictional Planning Meeting: Area A VisualRisk Training
3/8/2004
Description: Multi-Jurisdictional training on V Risk product and discussion of planning process.
Attendees: Culver City - Anna Alvarado, Heather Burton, Craig Johnson, Ali Farassati
Santa Monica - Paul Weinberg, West Hollywood - Kristin Cook
Beverly Hills - Ron Derderian, Joy Davis, Pamela Mottice-Muller, Teri Rodriguez, Donna Jerex, Vincent Chee, Sam Lee
Location:
Beverly Hills Library, Computer Training Room
Beverly Hills, CA 90210

Kick-Off Meeting
3/3/2004
Description:
Attendees: Mahdi Aluzri, Pamela Mottice-Muller, Roderick Wood, Roxanne Diaz, Chief Pete Bonano, Chief David Snowden, David Gustavson, Rob Beste, Steve Miller, Maria Rychlicki, Julie Kahn, Don Oblander, Keone Kali.
Location:
City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Los Angeles County Planning Workshop
1/28/2004
Description: Training on how to complete plan.
Attendees - Nicole Everett, Pamela Mottice- Muller
Location:
Huntington Library, 171 S. Los Robles Ave.
Pasadena, CA 91101

Hazard Mitigation Plan Implementation
1/12/2004
Description: Follow-up Meeting.
Attendees - Katie Wilson, Mahdi Aluzri, George Chavez, Pamela Mottice-Muller
Description- Discussed how to organize and complete plan.
Location:
City Hall Planning Dept., 455 N. Rexford Dr.
Beverly Hills, CA 90210

Multi Jurisdictional Hazard Mitigation Plan Implementation
1/7/2004
Description: Area A, West Hollywood, Culver City, Santa Monica, and Beverly. Meeting to discuss how cities will complete and implement plan.
Attendees: Area A representatives
Location:
OEM Office, 345 Foothill Rd.
Beverly Hills, CA 90210

Multi Jurisdictional Hazard Mitigation Plan Implementation
1/5/2004
Description: Los Angeles County Meeting to learn what the County is developing regarding their Hazard Mitigation Plan and how the city can be part of this process.
Attendees: County Representatives
Location:
County Lot EOC, Eastern Ave.
Los Angeles, CA

Initial Meeting
10/1/2003
Description: To review info on the potential to develop a Hazard Mitigation Plan for the city to meet Federal Requirements. Discussed how this will fit into General Plan process.
Attendees - Audrey Arlington, Mahdi Aluzri, Ron Clark, Sam Lee, Pamela Mottice Muller
Location:
City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

APPENDIX F

Public Involvement Events and Meetings

Neighborhood Watch
Neighborhood Watch meetings were conducted which covered the importance of Neighborhood Watch and how Neighborhood Watch relates to the elements of "Citizen Corp.", as well as, emergency preparedness, and a terrorism overview. A video presentation was also disseminated city wide over the City's Cable Channel. The topic for this year's presentation was "Homeland Security and You."

The following is the list of Neighborhood Watch Meeting Dates:
Tuesday April 13, 1:00pm,
Wednesday April 14, 1:00pm -2:30pm
Thursday April 15, 7:00pm
Wednesday April 14, 7:00pm-8:30pm
Tuesday April 20, 7:00pm,
Wednesday April 21, 7:00pm,
Thursday, April 22, 7:00pm
Tuesday April 27, 7:00pm
Wednesday April 28, 1:00-2:30pm
Thursday, April 29, 7:00pm
Wednesday April 28, 7:00-8:30pm
Tuesday May 11, 7:00pm
Wednesday May 12, 1:00-2:30pm
Thursday May 13, 7:00pm
Wednesday May 12, 7:00pm
Tuesday May 18, 7:00pm
Wednesday May 19, 7:00pm
Thursday May 20, 7:00pm
Tuesday May 25, 7:00pm
Wednesday May 26, 7:00
Thursday May 27, 7:00pm

The Following are Public Involvement Meetings and events conducted over the course of 2004:

Pamela Mottice-Muller

Safety Expo
10/10/2004
Description: First aid, safety and emergency preparedness supplies and educational information.
Attendees: City Agencies, Vendors
Location: Beverly Hills Farmers Market, 9300 Block of Civic Center Drive
Beverly Hills, CA 90210

BH Cable – September 2004
09/2004
BHPD: Homeland Security - 2

Planning Commission Meetings
08/12/2004
Description: Update on the Hazards Mitigation Plan to the Planning Commission.
Location**:** Conference Room A, City Hall
455 N. Rexford Drive, Beverly Hills, CA, 90210

BH Cable – August 2004
8/1/2004
Description: PROGRAMS DATES AND AIRED:
BHPD: Homeland Security - 2, 9, 10, 23, 30
Wildfire Awareness in BH - 3, 6
Wildfire: Home Ignitions – 4, 5, 10
NASA: Earthquakes – 1
Surviving the Big One - 26

BH Cable- July 2004
7/1/2004
Description: PROGRAMS AND DATES AIRED:
Homeland Security and Me- 1, 2
Wildfire Awareness in BH- 2,6,7,8,12,20,21,26,29,30
BHPD: Homeland Security- 5, 15, 16, 26, 28, 30
Badge of Safety: Apparatus- 5
NASA: Earthquakes- 5
BHPD: Identity Theft- 6, 8, 23, 27
Wildfire: Home Ignitions- 7, 9, 16, 19, 22, 27, 29
Disaster Alert: Citizen Corps- 7, 30
Disaster Alert: RSVP- 12, 22
Be Cool About Fire Safety- 19
BHFD: Earning the Badge- 21
Wildfire: Home Ignitions - 1

Beverly Hills School District Meeting
6/29/2004
Description: Planning meeting for current status of each section of the plan.
Attendees: Pamela Mottice-Muller and Gary Mortimer.
Location:
Public Works Department, 345 Foothill Road
Beverly Hills, CA 90210

Chamber of Commerce Government Affairs Committee
6/17/2004
Description: Provided information to the Chamber of Commerce on the development of the Hazard Mitigation Plan. Discussed hazards to City and sought input from the business community on potential mitigation strategies.
Attendees: Members of the City of Beverly Hills Camber of Commerce, Maria Rychlicki
Location:
Room A of City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Community Process Meeting
6/10/2004
Description: Reviewed Community Process- what has been done and what will be done info.
Attendees: Julie Kahn, Robin Chancellor, Maria Rychlicki, and Pamela Mottice- Muller.
Location: Public Works Building
345 N. Foothill Road
Beverly Hills, CA 90210

Neighborhood Information Exchange Group Meeting
6/7/2004
Description: provided update on the Hazard Mitigation Plan and solicited input from the public.
Attendees: Pamela Mottice-Muller, Maria Rychlicki. Director of Emergency Management and Direction of Community Relations
Location:
Room A of City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

BH Cable- June 2004
6/1/2004
Description: PROGRAMS AND DATES AIRED:
Homeland Security and Me-7, 8, 9,10,14,18,21,28,30
Wildfire: Home Ignitions- 7, 9, 10, 16,24,25,30
Wildfire Awareness in BH- 9,17,22,28
Disaster Alert: Business- 10
BHPD: Identity Theft- 23

Public Works Commission Meeting
5/27/2004
Description: Provided overview of Hazards Mitigation Project; asked for community input on process and development. Commission members offered comments and suggestions
Attendees: Commission members
Location:
Room A of City Hall, 455 N. Rexford Dr. Beverly Hills, CA 90210

Planning Commission Meeting
5/26/2004
Description: Provided overview of Hazards Mitigation Project; asked for community input on process and development. Commission members offered comments and suggestions
Attendees: Planning Commission
Location:
Room A of City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Recreation and Parks Commission Meeting
5/25/2004
Description: Provided overview of Hazards Mitigation Project; asked for community input on process and development. Commission members offered comments and suggestions
Attendees: Commission members
Location:
Room A of City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

BH Cable- May 2004
5/1/2004
Description: PROGRAMS AND DATES AIRED:
Wildfire Awareness in BH- 3,4,7,19,24
Disaster Alert: RSVP- 5, 20
Disaster Alert: Citizen Corps- 7
Disaster Alert: Children- 12
BHFD: Earning the Badge- 19
BHPD: Identity Theft- 21, 26

CERT Meeting
4/21/04
Description: Community class completed Hazards Vulnerability Analysis and discussed the development of the Hazards Mitigation Pan
Attendees: Community members
Location: Fire department Training Room
445 N. Rexford Dr.
Beverly Hills, CA 90210

BH Cable- April 2004
4/1/2004
Description: PROGRAMS AND DATES AIRED:
BHFD: Chain of Survival- 5, 15
EduNews: Safe Schools- 5
Disaster Alert: Schools- 5, 14

BHPD: Neighborhood Watch- 6, 28
Disaster Alert: Citizen Corps- 8, 13, 30
Disaster Alert: RSVP- 9, 21
Disaster Alert: Evacuation- 12
Disaster Alert: The EOC- 12, 16
Badge of Safety: Apparatus- 13
Disaster Alert: Children- 14,20,22,28
Disaster Alert: Pet Safety- 15
Badge of Safety: Outreach- 20

City Council Approval
3/2/2004
Description:City Council Approves development of the plan
Attendees: Council Members, Pamela Mottice-Muller
Location:
City Hall, 455 N. Rexford Dr.
Beverly Hills, CA 90210

BH Cable- March 2004
3/1/2004
Description: PROGRAMS AND DATES AIRED:
Disaster Alert: Children- 2,4,5,8
BHPD: Identity Theft- 3
BHFD: Earning the Badge- 9
BHPD: Neighborhood Watch- 17

Team Beverly Hills Meeting
2/25/2004
Description: Description- Meet with Team Beverly Hills, members of the community to discuss plan and complete Hazard Vulnerability Analysis study.
Location:
City Hall Room A, 455 N. Rexford Dr.
Beverly Hills, CA 90210

Article in Beverly Hills Weekly
2/25/2004
Description: "City Council May Approve Mitigation Plan Development" on page 4

Article in Beverly Hills Courier
2/13/2004
Description: "BH Disaster Plan To Be Approved by Council" on Page 1, continuing on page 35

BH Cable- February 2004
2/1/2004
Description: PROGRAMS AND DATES AIRED:

BHFD: Chain of Survival- 2
Disaster Alert: Schools- 2
Disaster Alert: Winter Storms- 18

BH Cable- January 2004
1/1/2004
Description: PROGRAMS AND DATES AIRED:
BHPD Neighborhood Watch- 5, 13, 21
Disaster Alert: Winter Storms- 6, 8,26,28,30
Safety Week 2003- 7, 22
BHFD: Chain of Survival- 8
EduNews: Child Safety- 12, 15
Disaster Alert: RSVP- 16
BHFD: Earning the Badge- 16
BHPD: Terrorism- 22
Disaster Alert: Shelter in Place- 28
Disaster Alert: Terrorism- 29

Beverly Hills Website
Information was posted on the city's website, www.beverlyhills.org, regarding the Hazards Mitigation Plan with a contact person to call for further information.

Acknowledgements

The Hazards Mitigation Plan has been a very comprehensive project that required the efforts, intellect and patience of numerous staff individuals within the City of Beverly Hills. The scholarly research involved to obtain historical backgrounds and compose sound mitigation strategies was a tremendous accomplishment and is greatly appreciated not only by city staff but by city residents as a whole. The Hazards Mitigation Plan is vital in reducing the possibility of the loss of life and property during and after an emergency situation. This would not have been possible without the following individuals:

Honorable Council Members:
Mark Egerman
Linda Briskman
Jimmy Delshad
Thomas Levyn
Steve Webb

Adolfo Castano, Print Shop
Aram Chobanian, Art Director of Graphic Arts Services
Captain Steven Vance, Fire Department
Cathy Cassells, Graphic Arts Services
Chief David Snowden, Police Department
Chief Pete Bonano, Fire Department
Dan Webster, Deputy City Manager
David Gustavson, Director of Engineering Services
David Schirmer, Information Technology
Deputy Fire Chief Robert Cavaglieri, Fire Department
Don Oblander, Chief Financial Officer
Donna Jerex, Planning
Ed Otsuka, Public Works
Joseph Reis, Information Technology
John Kamp, Planning
John Lane, Graphic Arts Services
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Karl Nelson, Print Shop
Ken Pfalzgraf, Recreation and Parks
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Larry Sakurai, Planning
Lian Kimia, Public Works
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Maria Rychlicki, Director of Community Relations
Mark Geddes, Information Technology
Nicole McClinton, Information Technology
Pamela Mottice-Muller, Director of Emergency Management

Rob Beste, Director of Public Works
Roderick Wood, City Manager
Roxanne Diaz, City Attorney's Office
Sam D. Lee, Building and Safety
Shana Epstein, Public Works
Steve Miller, Director of Recreation and Parks
Vincent Chee, Building and Safety
Viviana Franco, Emergency Management
Walter Burnett, Public Works