



CITY OF BEVERLY HILLS LOCAL HAZARD MITIGATION ACTION PLAN 2017-2022



Creating and maintaining a safer, more sustainable community

This Page Intentionally Left Blank

Table of Contents

Executive Summary	1
Part I: Mitigation Action Plan.....	17
Section 1: Introduction.....	17
Section 2: Community Profile	31
Section 3: Risk Assessment	45
Section 4: Multi-Hazard Mitigation Strategies	61
Section 5: Plan Maintenance.....	101
Part II: Hazard Specific Information.....	107
Section 6: Earthquake	107
Section 7: Wildfire.....	129
Section 8: Terrorism	153
Section 9: Flood	167
Section 10: Landslide.....	183
Section 11: Windstorm	193
Section 12: Drought	203
Section 13: Special Events.....	209
Part III: Resources.....	217
Appendix A: Plan Resource Directory	217
Appendix B: Local Hazard Mitigation Action Plan Review Crosswalk	231
Appendix C: Natural Hazard Risk Analysis Rating Form.....	237
Appendix D: Planning and Public Involvement Meetings/Events	241
Appendix E: CEQA Exemption/City Council Plan Adoption Resolution	245
Appendix F: Acknowledgements.....	247

List of Maps

Map 1: City of Beverly Hills	20
Map 2: Geography and the Environment	32
Map 3: Metro Purple Line Extension Section 1	37
Map 4: Current Land Use in the City of Beverly Hills	41
Map 5: Public and Private Critical Facilities	52
Map 6: Public Critical Infrastructure	54
Map 7: Seismic Hazards 3-D Animation of the Los Angeles Area.	108
Map 8: M3.4 Beverly Hills Earthquake - Friday, September 7, 2015	109
Map 9: Earthquakes in Southern California in July 2014	111
Map 10: Topography of the Los Angeles Basin	114
Map 11: City of Beverly Hills Liquefaction Zones	119
Map 12: Known Earthquake Faults Near the City of Beverly Hills	121
Map 13: City of Beverly Hills Fire Hazard Zones.....	137
Map 14: Water Pressure Zones in Beverly Hills.....	143
Map 15: City of Beverly Hills Flood Areas.....	169
Map 16: Slope Instability Potential Map	189
Map 17: U.S. Drought Monitor, August 22, 2017	205
Map 18: Sacramento-San Joaquin River Delta	207
Map 19: Projected Spring Precipitation Change for 2080 – 2099 Compared to 1961-1979 Under Two Emission Scenarios	208
Map 20: Road Closures in Beverly Hills for the Los Angeles Marathon	214

List of Tables

Table 1: 2017-2022 Mitigation Strategies Overview	7
Table 2: Occupied Housing Units in Structure	18
Table 3: FEMA Major Disaster Declarations (DR), Los Angeles County 2000 – 2017	19
Table 4: City of Beverly Hills Disasters Since 1990	19
Table 5: Local Climate.....	32
Table 6: Number of Units Built by Year.....	33
Table 7: General Demographic Information	34
Table 8: Existing Land Uses	42
Table 9: Regional Housing Needs Assessment 2014–2021, Beverly Hills	43
Table 10: Net New Housing Units per Year	43
Table 11: Federal Criteria for Risk Assessment	45
Table 12: Residential Structures by Year Built	56
Table 13: Building Value in Hazard Areas	57
Table 14: Prioritization and Benefit Analysis of Mitigation Strategies	99
Table 15: Magnitude 5.0 or Greater Southern California Earthquakes Since 1933.....	110
Table 16: Seismic Building Codes.....	125
Table 17: Partial List of California Building Codes	127
Table 18: Largest California Wildfires Since 2003	131
Table 19: 2007 Los Angeles and Ventura Firestorm Statistics.....	131
Table 20: The 20 Largest California Wildfires	133
Table 21: Sample Hazard Identification Rating System	140
Table 22: Summary of Terrorist Incidents in California*, 2005 - Present.....	155
Table 23: Significant Reservoir Failures in Southern California.....	176
Table 24: Santa Ana Wind News Stories.....	194
Table 25: Windstorm Incident Records for Beverly Hills	195
Table 26: Beaufort Wind Scale	196
Table 27: Weekly Palmer Drought and Crop Moisture Data for the Climate Divisions in the Western Region, Week 26 of the 2017 Growing Season	205
Table 28: National Integrated Drought Information System Alerts for Droughts	206
Table 29: Commercial Special Event Permits	211
Table 30: Residential Special Event Permits	213

List of Charts

Chart 1: Daily Earthquakes in Southern California, July 2014.....	112
Chart 2: Southern California Seismic Network (SCSN) Events, 1930 -2009.....	112
Chart 3: Acres Burned in the Lower 49 States, 1990-2013	133

List of Images

Image 1: Construction Schedule	38
Image 2: Wilshire/La Cienega Station	39
Image 3: Section 2	40
Image 4: Wireless Network Access Request	164
Image 5: Number of wireless clients on network at a specific time	165

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 of 2000 required state and local governments to develop hazard mitigation plans by November 2004. On March 2, 2004 the Beverly Hills City Council approved the development of such a plan. In October 2004, the City Council approved the plan and in December 2004 the Federal Emergency Management Agency (FEMA) approved the final plan. As required by FEMA, the Plan must be updated every five years so on August 17th, 2010 the required update was adopted by the City Council and was approved by FEMA on March 4, 2011. The 2017-2022, 5-year update to the Plan was adopted by City Council on January 8, 2019 and approved by FEMA on February 6, 2019.

PLAN UPDATE

The mitigation planning regulation at 44 CFR §201.6(d) (3) states:

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.

This Local Hazard Mitigation Action Plan describes elements of the five-year plan updates as required at 44 CFR §201.6(d) (3).

The plan update is now completed and on January 8, 2019, the City Council adopted the resolution approving the Local Hazard Mitigation Action Plan 2017-2022. This plan constitutes the update required every five years. This plan was developed specifically and only for the City of Beverly Hills.

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, Resilience and Recovery with participation from all City departments and the public. The City of Beverly Hills Local Hazard Mitigation Action Plan (LHMAP) includes resources and information to assist City departments, residents, public and private sector organizations, and others interested in participating in planning for hazards. During the third update of the City's LHMAP, each section of the plan was updated with the most current information using a variety of resources. Each Project Coordinator was assigned to update a section of the plan. Each of the plan sections provides information on the history, economic and social impact of a specific hazard. More information regarding the updating process is included in "Section 1: Introduction."

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, cyber terrorism, landslides, flooding, wind storms, and drought. 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.

The only major development pertinent to the LHMAP is the construction of the Metro Purple Line, however the current construction phase doesn't warrant revision to the plan yet. It is expected that this construction project may impact mitigation activities in the next plan update.

The LHMAP was also updated to reflect the city's expanding priorities to include the special events hazard and cyber terrorism sub-hazard (within the terrorism section).

PLAN OVERVIEW

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 Mitigation Strategies

This section provides information on the plan goals and strategies that address the 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 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, the economic and social impacts of the hazard, and how each hazard is affected by climate change. 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: Wildfire

Section 8: Terrorism

Section 9: Flood

Section 10: Landslide

Section 11: Windstorm

Section 12: Drought

Section 13: Special Events

Part III: Resources

Resources include, but are not limited to, all information, materials, resources, etc. used to gather information to assemble the entire Local Hazard Mitigation Action Plan.

PARTICIPANTS

The update 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, Resilience and Recovery with participation from all City departments. The Steering Committee was comprised of the Fire Chief, the Police Chief, Director of the Office of Emergency Management, Resilience and Recovery, Community Development, Community Services, Administrative Services, Information Technology, Public Works Services, and the City Attorney's Office. The Project Coordinators are comprised of subject matter experts from each department who draft the Plan. The public was invited to participate in the original development of the plan in 2004 and for the updates in 2010 and 2017.

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 original Steering Committee drafted the mission statement, plan goals, identified the hazards, and helped update and approve the plan and strategies. Project Coordinators were appointed by each City Department Head. Each Project Coordinator was assigned to update a section of the plan and to collaborate with the Steering Committee and other Project Coordinators on the final work product. The Project Coordinators have changed over the years to reflect the change of personnel and growth of the city.

Neighboring communities and other local agencies and interested parties were also invited to be a part of the Beverly Hills LHMAP. The main venue in which this occurred was the Multi-Jurisdictional Planning Meetings for Area A. This standing group is comprised of jurisdictions in the west Los Angeles region. During Area A Planning Meetings, the Beverly Hills' LHMAP was presented to attendees, who were invited to participate in the planning effort by providing feedback to the plan. Beverly Hills also worked with the County of Los Angeles Office of Emergency Management to confirm statistics and data used in the construction of this plan.

Local residents were also invited to participate in the LHMAP process through a number of public events (See Appendix D for specific events). Residents were invited to attend these events through:

- The City's website;
- Flyers in the City Library and on the bulletin board;
- Advertisements in three local newspapers (the Beverly Hills Courier, Beverly Hills Weekly, and the Beverly Press); and,
- Emails to various City groups from the Fire Department and Policy and Management Department.

A record of all meetings and events pertaining to the development of the LHMAP can be found in Appendix D: Planning and Public Involvement Meetings/Events.

MISSION

The City of Beverly Hills Local Hazard Mitigation Action 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 implementing this plan to guide the City towards creating and maintaining a safer, more resilient community.

GOALS

The plan goals describe the overall direction that the 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 disasters. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations that are outlined in the strategies. Goals and mission are discussed in depth in Section 4 of this plan.

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.
- Integrate the Safety Element of the General Plan into the Local Hazard Mitigation Action Plan.

Emergency Management, Resilience, and Recovery

- 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.

MITIGATION STRATEGY OVERVIEW

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 chart provides an overview of the strategy organization. Mitigation strategies were developed through numerous discussions with stakeholders and review of pertinent plans and documents.

HAZARD	The hazard the strategy mitigates.		
PROJECT NAME	Name of the Mitigation project strategy.		
DESCRIPTION	Strategy description.		
ACTION ITEM	Actions required 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 a way 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

Table 1: 2017-2022 Mitigation Strategies Overview

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**) Timeline	Associated Plan(s)	Plan Goals Addressed			
					To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Flood	1	Stormwater Physical Protection. Design and construct a flood barrier around the Police Station, Library, and parking structure to prevent water from entering these area to provide physical protection against storm water exposure	Public Works, Risk Management, Emergency Management	2020	Flood Emergency Response Plan (FERP)	X		X
Multi-Hazard	2	Risk Management Plan for Ammonium Hydroxide Release. Reconsider Hazardous Material Accidents in the Local Hazard Mitigation Action Plan to account for the large quantity of ammonium hydroxide used at the City's Water Treatment Plant.	Fire Department, Public Works, Risk Management, Emergency Management	2018	CAL-ARP	X		X
Flood	3	Improve FERP (Flood Emergency Response Plan). Add the following components to FERP – A reliable flood warning method, a person who has the authority to activate the plan, a clear list of responsibilities for the key leaders, documented de-energization and shutdown procedures, actions to reduce the damage by using available resources and staff, and a recovery and cleanup plan.	Office of Emergency Management, Resilience and Recovery, Public Works, Risk Management	TBD	Flood Emergency Response Plan (FERP)	X		X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Earthquake	4	Improve Sprinkler System Bracing. Determine the costs and benefits in protecting City Facilities to the level of Highly Protected Risk.	Fire Department, Public Works, Risk Management, Office of Emergency Management, Resilience and Recovery	2020	N/A	X			X
Terrorism	5	Station/City Facilities/including Critical Facilities/Metro Line Assessment. Conduct an analysis and assessment of critical infrastructure areas and how each area interfaces with both cyber and physical components if attacked or compromised. Identify the cascade affect, if any, impacting operations should an attack or compromise occur.	Police	Ongoing	N/A	X	X	X	X
Earthquake	6	Seismic Retrofit of existing wood-framed soft-story buildings. Perform field survey to identify potentially vulnerable wood-frame soft-story multi-story buildings. Develop a program to	Community Development	2017 - 2020	Encourage voluntary compliance with the City's Soft Story	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
		verify and seismically retrofit the buildings at-risk.			Retrofitting Standards.				
Earthquake	7	Seismic Retrofit of Existing Non-Ductile Concrete Buildings. Perform field survey to identify potentially vulnerable non-ductile concrete buildings. Develop a program to verify and seismically retrofit the buildings at-risk.	Community Development	2021	Development of proposed ordinances aimed to mitigate the seismic risk of existing non-ductile concrete and pre-Northridge moment frame buildings.	X	X	X	X
Earthquake	8	Seismic Retrofit of existing steel frame buildings. Perform field survey to identify potentially vulnerable steel moment-frame buildings. Develop a program to verify and seismically retrofit the buildings at-risk.	Community Development	2021	Development of proposed ordinances aimed to mitigate the seismic risk of existing non-ductile concrete and pre-Northridge moment frame buildings.	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Earthquake	9	USGS ShakeAlert. The City of Beverly Hills is serving as a Beta tester for an earthquake early warning system.	The Office of Emergency Management, Resilience and Recovery, Police Department, Fire Department, Building & Safety, IT (GIS)	2017	Emergency Operations Plan	X			X
Multi-Hazard	10	Disaster Ready. Give City businesses the tools they need to prepare themselves to be self-sufficient in the event of a disaster. Participating businesses are encouraged to spread the word of this program to their surrounding neighbors. Businesses will be recognized for their efforts.	The Office of Emergency Management, Resilience and Recovery	2016	Emergency Operations Plan	X			X
Flood	11	Update Flood Damage Prevention Ordinance. Update flood construction provisions in Beverly Hills Municipal Code to coordinate with updated FEMA maps for the City.	Community Development, Public Works	2018	Beverly Hills Municipal Code	X	X	X	X
Flood	12	Greystone Reservoir, Reservoir 4A and LADWP water transition pipeline inundation and water pipe maps. Hire a consultant to develop & update the	Public Works Engineering	2017-2018	Flood Emergency Response Plan (FERP)	X			X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
		Greystone Reservoir and Reservoir 4A and develop LADWP maps and inundation maps.							
Flood	13	SM Blvd project alleyway flooding. Replace insufficient catch basins and pipelines with new ones that have enough capacity and connecting it to the main storm drain line directly.	Public Works, Community Development, Policy and Management, Community Services	2018	Flood Emergency Response Plan (FERP)	X			X
Multi-Hazard	14	Evacuation Route. Develop and Educate Residents on a Citywide evacuation route during a disaster.	Police, Office of Emergency Management, Resiliency, and Recovery, Fire	TBD	N/A	X	X	X	X
Drought	15	Water conversation project. Increase water conservation campaign exposure throughout the City. Implement innovative water saving devices and programs for residents and businesses.	Public Works	2017	UWMP (Urban Water Management Plan)	X	X	X	X
Drought	16	Rehabilitation of Cabrillo Reservoir and Non-Potable Water Distribution System. Rehabilitate abandoned water reservoir to store non-potable water for city municipal uses.	Public Works	TBD	N/A	X	X		X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Drought	17	Green Streets and Water Efficient Landscape on Burton Way Median. The project consists of constructing green street function on the median to collect urban runoff during a storm event to prevent pollutants from entering the storm drain system.	Public Works	2017 - 2021	EWMP (Enhanced Watershed Management Program)	X	X		
Drought	18	La Cienega Park and Frank Fenton Field Stormwater Retention and Groundwater Recharge. The project has a potential to capture 24.0 acre-feet of urban runoff from a large drainage area from the cities of West Hollywood, Los Angeles, and Beverly Hills. The purpose of the project is to collect urban runoff during a storm event to prevent pollutants from entering the storm drain system. The water collected will be treated and used to recharge the ground water aquifer.	Public Works	2021-2022	EWMP (Enhanced Watershed Management Program)	X	X	X	
Drought	19	Shallow Groundwater Wells. Increase the City's water supply. Develop and construct two shallow groundwater wells.	Public Works	2018	N/A	X			X
Multi-Hazard	20	Building and Fire Code Updates. Continue to update the City's building and fire codes once every three years, or	Community Development, Fire	2017 - 2020	Beverly Hills Building and Fire Codes	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
		whenever the State updates the California building and fire codes, to reflect the highest and best available standards for seismic design and performance of buildings and to conform to State requirements. Review and update existing city codes to reflect recommendations set forth by the FireWise assessment and Joint Wild land Interface Task Force.							
Fire	21	Vegetation Management Public Education. Develop public education material to the residents regarding Vegetation Management around their homes.	Fire	2017-2021	Annual Brush Clearance PR Campaign	X	X		X
Multi-Hazard	22	Inter-jurisdictional Coordination. Continue to coordinate with and support the Los Angeles County Certified Unified Program Agency (CUPA), the Los Angeles County Fire Department, and their Health & Hazardous Materials Division (HHMD) in carrying out inspections, emergency response, enforcement, and site mitigation oversight of hazardous materials and waste.	Office of Emergency Management, Resilience and Recovery, Fire	Ongoing	Emergency Operations Plan	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Associated Plan(s)	Plan Goals Addressed			
						To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Fire	23	Wood Roof Public Education DVD. Educate Residents on the potential fire hazard regarding Wood Roofs.	Fire , Office of Emergency Management, Resilience and Recovery,	2018-2019	N/A	X	X	X	X
Cyber Terrorism	24	Cybersecurity Education. Education to city employees and the public on cybersecurity.	IT , Human Services, Police Department, Health and Safety Commission/OEM	2019	Strategic Technology Plan	X	X		
Utility Failure	25	Water Storage and Distribution. Develop a plan for water storage preparation and water distribution during infrastructure failure	Public Works , OEM	2019	Emergency Operations Plan	X			
Terrorism	26	Bollard Study. Perform study to determine if bollards would increase security in the city by placing in strategic locations.	Police Department	2020	N/A	X			

IMPLEMENTATION, MONITORING, AND EVALUATION

The Plan Maintenance section of this document details the formal process that will ensure that the City of Beverly Hills Local Hazard Mitigation Action 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 plan constitutes the needed revisions and includes any new mitigation strategies, programs and activities that mitigate against the loss of life or property due to hazard activity. 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.

PLAN ADOPTION

The City Council adopts the City of Beverly Hills' Local Hazard Mitigation Action Plan. Once the plan has been adopted, the City's Director of Emergency Management, Resilience, and Recovery will be responsible for submitting it to the State Hazard Mitigation Officer at the Governor's Office of Emergency Management, Resilience and Recovery. The Governor's Office of Emergency Management, Resilience and Recovery 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 Local Hazard Mitigation Action Plan 2017-2022 will be significant in the future growth and development of the community. The Beverly Hills Local Hazard Mitigation Action Plan third renewal was approved by the City Council on **January 8, 2019**. The City Council Resolution adopting the plan is set forth as Appendix E. The Plan will then be integrated into the City's General Plan.

COORDINATING BODY

A City of Beverly Hills Local Hazard Mitigation Action Plan 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 Local Hazard Mitigation Action Plan, and the Hazard Mitigation Steering Committee will take responsibility for plan implementation. The Director of the Office of Emergency Management, Resilience and Recovery 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 and Project Coordinator 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 Local Hazard Mitigation Action 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.

Through 2009, the City updated its General Plan which included, as part of a mitigation strategy offered in the 2004 LHMAP, the creation of the Safety Element of the plan. The Safety Element has been completed and approved in 2010 by the City Council. In developing the current mitigation strategies, there was much reference to the Safety Element of the General Plan to ensure cohesiveness between the LHMAP and the Safety Element.

The annual 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.

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. Cost-benefit analyses were conducted on projects during the evaluation process. Projects that lacked reasonable implementation and financial feasibility were eliminated.

FORMAL REVIEW PROCESS

The City of Beverly Hills Local Hazard Mitigation Action 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 Local Hazard Mitigation Action 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 as part of the City's General Plan. 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's Office of Emergency Management, Resilience and Recovery website contains an email address and phone number to which the public can direct their comments and concerns on the plan.

PART I: MITIGATION ACTION PLAN

SECTION 1: INTRODUCTION

The purpose of this document is to develop, and update a plan for responding to the potential hazards that may affect the City of Beverly Hills. As part of this process, the City partners with residents, the business community, and various stakeholders to create a Local Hazard Mitigation Action Plan (LHMAP) that addresses the potential impacts of hazardous events and does this in a way that makes sense to the community. Identifying the risks posed by hazards and developing strategies to reduce potential impacts from those hazards can assist in protecting the life and property of residents, property owners, and workers in the city. In turn, this tends to reduce the level of risk presented by, and helps reduce losses from, future hazard events.

Southern California is vulnerable to earthquakes, flooding, terrorism, cyberterrorism, windstorms, fires, drought, and the effects of climate change. These hazards can potentially expose residents and businesses to the financial and emotional costs of losing their homes and livelihoods and needing to recover once a hazardous event has subsided. The region's and the community's risk associated with hazards increases as the region's and the community's population grows.

The City of Beverly Hills is a 5.7 square mile municipality surrounded by the cities of Los Angeles and West Hollywood (See Map 1). It was incorporated in 1914. Approximately 34,663 people live in Beverly Hills (2011-2015 American Community Survey 5-Year Estimate). The city's daytime population has been estimated as low as 110,000 and as high as 150,000. As of 2016, Beverly Hills is the 36th most populous city of the 88 cities in Los Angeles County (2011-2015 American Community Survey 5-Year Estimate).

As a General Law City, the City is governed by five City Council members elected for overlapping terms. The City employs close to 1,000 full- and part-time employees. City departments include Administrative Services, City Clerk, Community Development, Community Services, Fire, Police, and Public Works. 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 an incidence rate of crime that is lower than that in any surrounding agency.

The City of Beverly Hills is known for its lush garden-like setting; a result of the City's municipal parks, botanical gardens, and tree-lined streets. The City estimates that there are 24,874 trees lining the City's streets. Community residents also pride themselves in the rich and lush landscaping.

Today Beverly Hills is an important retail, financial, and professional center. According to the Los Angeles County Assessor's Office, net assessed property valuation exceeds \$29 billion, and real estate is priced accordingly. The Business Triangle, which is between Santa Monica Boulevard, Wilshire Boulevard, and Canon Drive, attracts many commercial businesses. The rent along Rodeo Drive, a north-south running street close to the center of the business triangle, can be as high as \$264 per square foot annually (\$22.00 per square foot per month).

Residential housing is costly in the City as well. Approximately 90% of the City is zoned for residential use. Single family properties range from one room bungalows to 40+ room mansions. Census data shows the median owner-occupied residence is worth \$1.7 million (of the 5,981 owner-occupied residences, only 1,311 residences (21.9%) were worth less than \$1 million). Of the 14,519 occupied housing units, 41.2% are owner-occupied and 58.8% are renter-occupied. The median rent cost is \$1,928 per month, however 11.9% of renters pay over \$3,000 per month; 41% of renters spend 35% or more of their income on rent (all above census data from DP04 Selected Housing Characteristics, 2011-2015 American Community Survey 5-Year Estimate).

Table 2: Occupied Housing Units in Structure

	Total	Owner-Occupied	Renter-Occupied
Total Occupied Housing Units	14,519	5,981	8,538
1, detached	35.3%	72.3%	9.4%
2, attached	1.2%	1.2%	1.2%
2 apartments	4.4%	1.4%	6.5%
3 or 4 apartments	6.8%	3.3%	9.3%
5 to 8 apartments	19.2%	2.7%	30.8%
10 or more apartments	32.7%	18.2%	42.8%
Mobile home or other type of housing	0.3%	0.8%	0.0%

Source: S2504 Physical Housing Characteristics for Occupied Housing Units, 2011-2015 American Community Survey 5-Year Estimates

With its celebrity residents, international boutiques, luxury hotels, and acclaimed restaurants, Beverly Hills has become a popular destination for vacationers and international 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.
- Historically, the southeast section of the City was vulnerable to flooding due as its lower elevation and an outdated storm drain system. Due to the completion of the LA County's Holly Hill Storm Drain upgrade project it would appear that this risk has been downgraded to minimal.
- The entire Los Angeles basin is considered as a risk area for a nuclear event or act of terrorism.
- The City is at high risk at its interface for urban wildfire.
- The area above Sunset Blvd. has been declared a High Fire Hazard zone.
- Cyberterrorism, special events, and climate change are also issues.
- The entire Los Angeles basin is considered as a risk area for the effects of climate change.
- Active shooter incidents.

Emergencies and disasters could cause damage to residents, businesses, infrastructure, and the environment. Any disaster would cost tremendous amounts of money in terms of response and recovery dollars, and economic disruption. Certain disasters would most likely result in injuries

or death of residents and visitors. The magnitude of these costs, and the potential to cause injury and deaths will increase as the population increases. A study was completed during the original drafting of the Local Hazard Mitigation Action Plan which identified terrorism, earthquakes, and wildfire as the most likely events to affect the City.

Throughout its history, the City of Beverly Hills has dealt with various hazards affecting the area. State, County, and local history shows that the region in which Beverly Hills is located is susceptible to earthquakes, earth movements including landslides and mudslides, flooding, fires (including wildland and structural) and wind storms. The potential impacts of hazards associated with the terrain make the environment and population vulnerable to geologically-based natural disasters.

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

Table 3 reflects significant disasters that occurred in Los Angeles County within the last ten years. There have been no significant hazards in the City of Beverly Hills between 2000 and 2017. Table 4 shows disasters within the City of Beverly Hills since 2000.

Table 3: FEMA Major Disaster Declarations (DR), Los Angeles County 2000 – 2017

Hazard Type	Disaster Name	Disaster #	Year	Federal Declaration
Severe Storm	Severe Winter Storms, Flooding, and Debris and Mud Flows	DR-1884	2010	3/8/2010
Fire	Sayre Fire/Freeway Complex Fire	DR-1810	2008	11/18/2008
Fire	Corral Canyon Fire	DR-1731	2007	10/24/2007
Freezing	Severe Freeze	DR-1689	2007	3/13/2007
Severe Storm	Severe Storms, Flooding, Landslides, and Mud and Debris Flows	DR-1585	2005	4/14/2005
Severe Storm	Severe Storms, Flooding, Debris Flows, and Mudslides	DR-1577	2005	2/4/2005
Fire	Southern California Wildfires	DR-1498	2003	10/27/2003

Source: FEMA Disaster Visualization Declarations Summary Dataset

Table 4: City of Beverly Hills Disasters Since 1990

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	1993	1/15/1993	\$267,390
Earthquake	Northridge Earthquake	DR-1008	1994	1/17/1994	\$1,439,219
Severe Storm	Severe Winter Storms	DR-1044	1995	1/13/1995	\$11,198
Severe Storm	Severe Winter Storms	DR-1884	2010	3/8/2010	\$41,835

Source: FEMA Disaster Visualization Declarations Summary Dataset

**Private Property Loss Amount: Unknown*

Map 1: City of Beverly Hills



Source: Google Maps

MITIGATION PLAN HISTORY AND BACKGROUND

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 required 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 demonstrates the importance of completing the original plan and updating as required.

Some of the required contents of a 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 Emergency Operations Plan contain requirements of the Local Hazard Mitigation Plan. Departments along with respective project coordinators reviewed existing documentation (See 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 Action 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 LHMAP:

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.

POPULATIONS AFFECTED

The City of Beverly Hills Local Hazard Mitigation Action 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 original and updated plans was a collaborative City and community effort. It was coordinated by the Office of Emergency Management, Resilience and Recovery with participation from all City departments. In each instance, a Steering Committee was established, composed of the Fire Chief, Police Chief, Director of the Office of Emergency Management, Resilience and Recovery, Community Development, Community Services, Administrative Services, Information Technology, Public Works, and the City Attorney's Office. The Steering Committee was chosen to facilitate the progression of the plan, provide imperative feedback, guidance, and approval. The original Steering Committee wrote the mission statement, plan goals, decided and approved the hazards, and approved 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 update a section of the plan. Each of the plan sections provides information on the historical, economic, and social impact of a specific hazard. The sections provide current mitigation measures instituted previously by the City of Beverly Hills and cite various sources as to where to obtain more information on each hazard. Various data and maps are used as well. In the writing of this updated plan, City of Beverly Hills staff collected data and compiled research to reflect the most current data and evaluated the effectiveness and milestones of the previous plan.

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 commission meetings, and developed the original mitigation plan and updated version (see Appendix A: Plan Resource Directory for a list of resources used to develop the plan). In addition, the Steering Committee conducted a rigorous reflection and analysis of previous plans/action items and developed updated goals.

THE STEERING COMMITTEE AND PROJECT COORDINATORS 2017-2022

The Hazard Mitigation Steering Committee convened about every four weeks over the course of eight months to guide renewal of the Mitigation Plan. Project Coordinators were chosen by the Steering Committee to update each Hazard's section within the overall plan. Most of the 2010-2015 and 2017-2022 committee members and project managers 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
City Manager
Office of Policy and Management

Susan Healy Keane
Director of Community Development
Community Development Department

George Chavez
Assistant City Manager/Director of Public Works Services
Office of Policy and Management/Public Works Services, Transportation & Engineering
Department

Ralph Mundell
Fire Chief
Beverly Hills Fire Department

Nancy Hunt-Coffey
Director of Community Services
Community Services Department

Pamela Mottice-Muller
Director of Emergency Management, Resilience, and Recovery
Office of Emergency Management, Resilience and Recovery

Sandra Spagnoli
Chief of Police
Police Department

Lolly Enriquez
Assistant City Attorney
Office of the City Attorney

Don Rhoades
Chief Financial Officer
Administrative Services Department

David Schirmer
Chief Information Officer
Information Technology Department

Project Coordinator Representatives:

Mark Cueno - Landslide
City Engineer
Public Works/Transportation & Engineering

Vincent Chee
Civil Engineer
Public Works/Transportation & Engineering

Barry Gauthier
Civil Engineering GIS Specialist
Public Works/Transportation & Engineering

Timothea Tway - Community Profile
Senior Planner
Community Development Department/Planning

Jesse DeAnda - Earthquake
Building Inspector
Community Development Department / Building & Safety

David Yelton - Earthquake
Building Inspection Manager
Community Development Department / Building & Safety

Raj Patel - Earthquake
Assistant Director
Community Development Department/Building & Safety

Evelin Welch - Earthquake, Flood
Management Analyst
Community Development Department

Ken Pfalzgraf - Windstorm
Parks and Urban Forest Manager
Public Works Services

Joseph Matsch - Fire
Fire Marshall
Fire Department

Scott Stephens - Fire
Battalion Chief/Fire Marshall
Fire Department

Trish Ray - Flood
Assistant Director of Public Works
Public Works Services/ Water Supply and Distribution

Josette Descalzo - Climate Change
Environmental Compliance and Sustainability Programs Manager
Public Works Services

Debbie Figoni - Climate Change
Water Conservation Administrator
Public Works Services

George DeMarois - Terrorism
Police Sergeant
Police Department

As shown in Appendix D, the Hazard Mitigation Steering Committee and various other stakeholders met regularly for more than eight months to update 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

In the writing of the original plan, 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. During the first and current updates of the plan, the same process was conducted to reflect the most current data. New hazards in the plan like drought, cyber terrorism, and special events (as well as the expected impacts of climate change on existing hazards) are expanded on in this version to heighten their priority level. Since developing the last plan these trends in our weather, our reliance on technology, and the past history of emergencies during special events has propelled the committee to add or heighten their importance.

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

- Federal Emergency Management Agency
- California Emergency Management Agency (CalEMA)
- California Department of Finance
- Los Angeles County Office of Emergency Management
- City of Beverly Hills School District
- Los Angeles County Fire Department
- Los Angeles County Public Works
- Los Angeles County Assessor's Office
- 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 CalEMA and FEMA

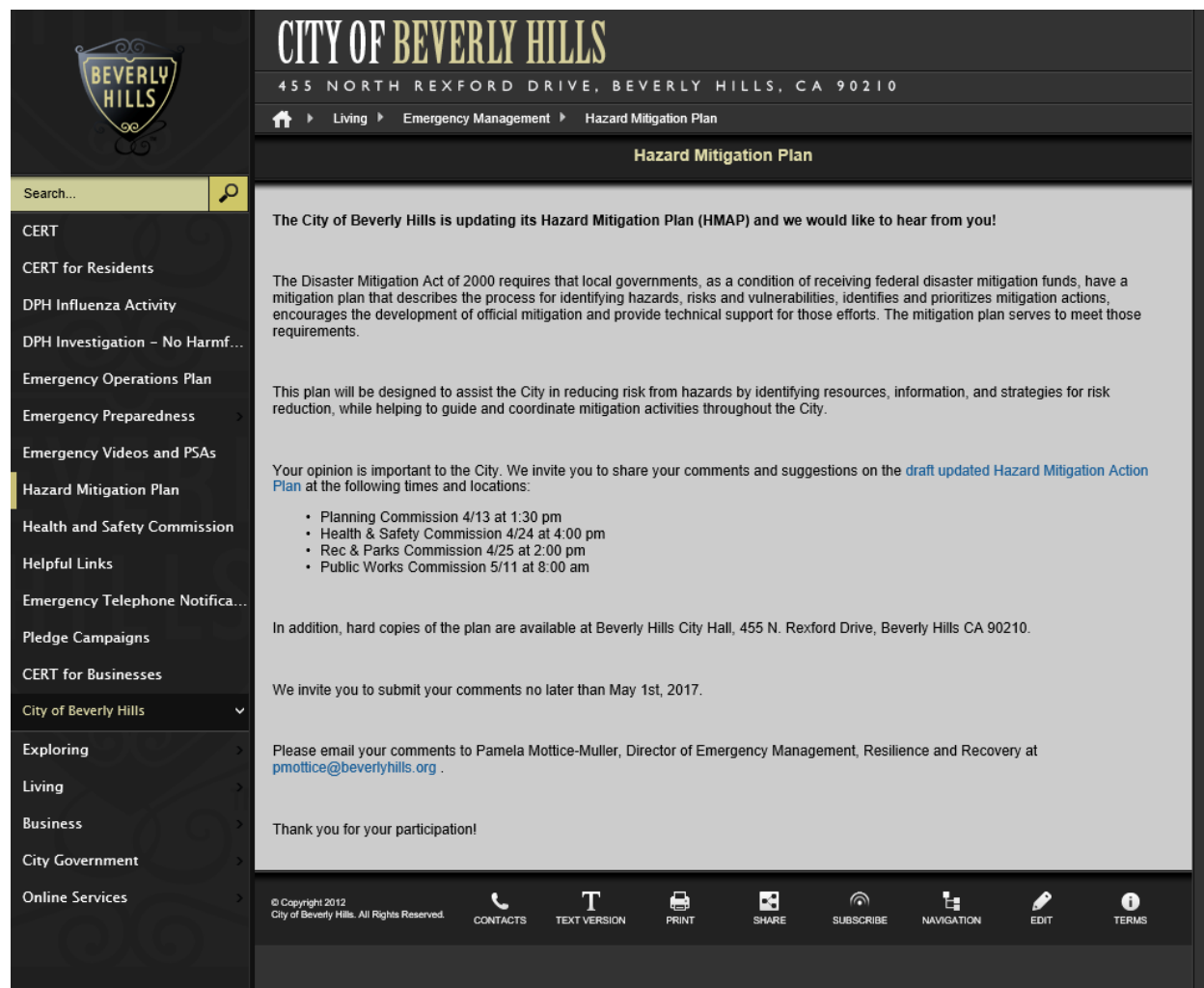
These requirements are spelled out in greater detail in the forthcoming plan sections and supporting documentation.

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 update of the plan. Information was provided on the City's website, at several Commission meetings, AM radio station, cable, and in the City newspaper.

The City of Beverly Hills' Local Hazard Mitigation Action 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 representative 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 Local Hazard Mitigation Action Plan. Information provided from these groups has been considered in the planning process of the plan.

During the renewal process, the City presented a draft of the plan to the Public Works, Recreation and Parks, Planning, and Health & Safety Commissions, whose meetings are aired on local cable channel Beverly Hills Television Channel 10 and are open to the public. The public was invited to provide input and comments on the renewal of the plan at these meetings. In addition, the plan was posted online, on the Office of Emergency Management, Resilience and Recovery webpage. The public was invited to view the plan online or at key public locations. The following is a screenshot of the public notice on the City's website:



The notice lets the public know where they may view physical copies of the plan as well.

The renewal process has been a collaborative effort with input from all departments and the community. The city has utilized its strong partnerships and 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. In addition, as part of the public process in 2004, 2009, and 2015, the City worked closely with the Neighborhood Watch.

The LHMAP was also presented at the Government Affairs Committee Presentation at the Beverly Hills Chamber of Commerce on 3/9/17.

See Appendix D for more information on public input opportunities.

CERT & EERT Classes

During the Community Emergency Response Team (CERT) & Employee Emergency Response Team (EERT) classes, the Local Hazard Mitigation Action Plan was an active part of the educational material and curriculum. City employees, community members and residents are encouraged to participate in these classes. Classes were held on the following dates:

- CERT:
 - 2016
 - 2/24 – Introduction to Disaster
 - 2/27 – Medical I/Medical II
 - 3/2 – Terrorism/Active Shooter Training
 - 3/5 – Disaster Psychology
 - 3/9 – Fire Extinguishers/Light Search and Rescue
 - 3/12 – Final Exercise
 - 2017
 - 2/8 – Introduction to Disaster
 - 2/11 – Medical I/Medical II
 - 2/15 – Terrorism/Active Shooter Training
 - 2/18 – Disaster Psychology
 - 2/22 – Fire Extinguishers/Light Search and Rescue
 - 2/15 – Final Exercise
- EERT:
 - 2016
 - 3/17 – Introduction to EERT
 - 4/5 – Fire and Hazmat Safety
 - 6/14 – Search and Rescue
 - 9/13 – Medical I/II
 - 11/8 – Disaster Psychology and Team Organization

The final draft of the Local Hazard Mitigation Action Plan was presented to various commissions. During these meetings, the commissions received an overview of the planning process, findings, and how this plan is relevant. The public was welcome to attend all commission meetings. Presentations were made at for the commissions:

- Public Works (May 11, 2017)
- Planning (April 13, 2017)
- Recreation and Parks (April 25th, 2017)
- Health and Safety (April 24th, 2017)

Citizen's Corps Initiative

After September 11, President Bush implemented the Citizen Corps initiative. This initiative supported community-based programs through citizen volunteer efforts. The national mission of Citizen Corps is to harness the power of every individual through education, training, and

volunteer service to make communities safer, stronger, and better prepared to respond to the threats of terrorism, crime, public health issues, and disasters of all kinds. Groups representing the City of Beverly Hills Citizen Corps are as follows:

- Neighborhood Watch
- Community Emergency Response Team (CERT)
- Employee Emergency Response Team (EERT)
- Business Emergency Response Team (BERT)
- Volunteers in Policing (VIP)
- Disaster Communications System (DCS)
- Medical Reserve Task Force (MRS)

Citizen Corp continues to be an important part of the City's emergency management program.

Neighborhood Watch

Neighborhood Watch meetings were conducted which covered the importance of Neighborhood Watch and how Neighborhood Watch relates to the elements of “Citizen Corps”, as well as emergency preparedness and a terrorism overview. The Neighborhood Watch also hosts National Night Out in August. Every year, in the spring, the Neighborhood Watch covers topics of emergency management. A video presentation was also disseminated City-wide over the City’s cable channel. The topic for 2009 presentation was “Emergency/Disaster Preparedness and Mitigation.” In 2010, the topic was “Personal Safety and the Internet.”

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

PLAN UTILITY

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 Local Hazard Mitigation Action Plan that remains current and relevant to the City of Beverly Hills.

The LHMAP 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 hazards in the mitigation plan.

Section 5: Plan Maintenance

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

Part II: Hazard Specific Information

Specific information on the hazards that pose the greatest threats to Beverly Hills 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 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: Wildfire

Section 8: Terrorism

Section 9: Flood

Section 10: Landslide

Section 11: Windstorm

Section 12: Drought

Section 13: Special Events

SECTION 2: COMMUNITY PROFILE

INTRODUCTION

The Community Profile section of this plan has been updated to reflect changes in the community and include more recently gathered data. Much of the information about housing and demographics has been incorporated from the City of Beverly Hills Housing Element, which was adopted in early 2014. This section describes the land use and development patterns in the City as well as identifies critical facilities and existing programs that may be assets in the event of a disaster. This section also identifies community vulnerabilities and estimates the potential cost to the community in the event of a disaster. The community profile is meant to inform the policies and programs included in the Plan, and provide information for community decision makers.

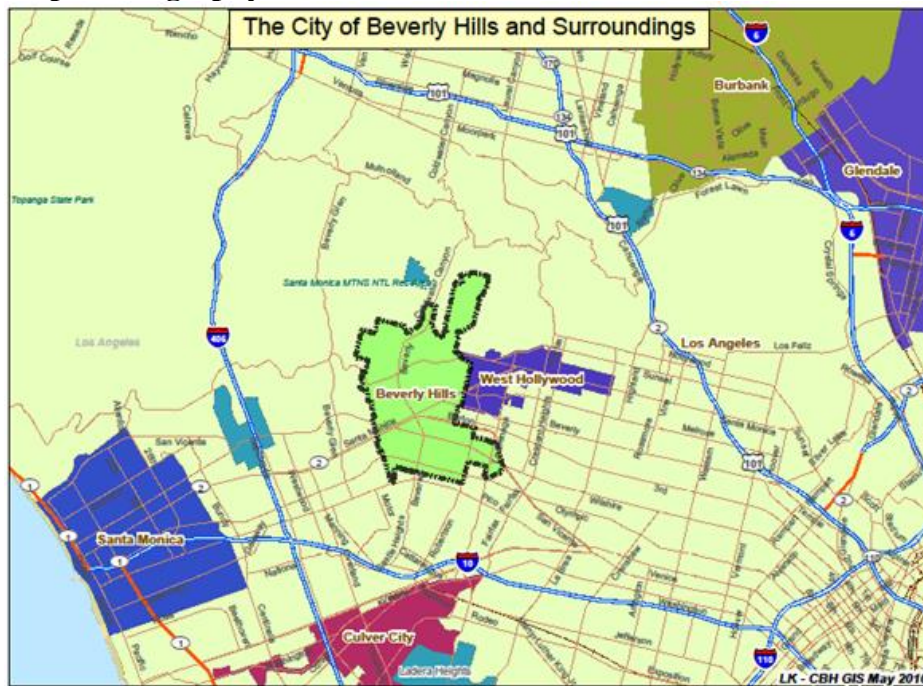
GEOGRAPHY AND ENVIRONMENT

The City of Beverly Hills is an approximately 5.7 square mile city located in the urbanized central region of Los Angeles County. Beverly Hills can be described as being essentially “built-out”, however this description can be misleading. Being built-out, as opposed to being “not built-out”, describes the relative amounts of vacant land remaining in a city. Development began in Beverly Hills over a century ago and today there are few, if any, vacant parcels of land in the city that have never been built on in the past; therefore the city is built-out. To construct a new building in the city of Beverly Hills today, typically an existing structure must first be removed. Since building codes have changed over time, typically the reconstruction or renovation of a property will result in a new or renovated building that meets all current building codes, and would be more capable of withstanding many natural hazards. The added safety resulting from advances in building design and construction oftentimes stands in contrast to the design and construction of older structures, and the ability of older structures to withstand major natural hazards.

Beverly Hills is located in the area of Los Angeles County, known as the Westside. The Westside area includes the cities of Beverly Hills, West Hollywood, Culver City, Santa Monica, and parts of the City of Los Angeles and the County of Los Angeles. The Westside is almost fully urbanized and includes several major business and retail centers such as: the Beverly Hills Business Triangle; Century City, Westwood Village, the Beverly Center, the Grove, and Miracle Mile in the City of Los Angeles; the “Melrose Triangle” and “Sunset Strip” in West Hollywood; and the central area of the City of Santa Monica in Santa Monica. The Westside also includes dense residential areas such as the Wilshire corridor, Park La Brea, north central City of Santa Monica, and the Beverly Center area. Several major institutions are also located on the Westside such as University of California, Los Angeles (UCLA), Santa Monica Community College, UCLA Hospital, Cedars-Sinai Hospital, Sony Pictures, Fox Studios, CBS, the Los Angeles County Museum of Art (LACMA), the Pacific Design Center, the J. Paul Getty Museum, and the Getty Villa.

The Beverly Hills street system consists of a grid of local-serving and regional serving streets. Regional access to the City is provided by the San Diego (405) and Santa Monica (10) freeways. Major east/west streets include Wilshire, Santa Monica, and Olympic Boulevards. Major north/south streets include Beverly and Doheny Drives, and Robertson and La Cienega Boulevards.

Map 2: Geography and the Environment



Source: *The City of Beverly Hills*

CLIMATE

Beverly Hills enjoys a dry, sub-tropical, Mediterranean- like climate. Very little precipitation, low humidity, and an abundance of sunshine are 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 Table 5.

Table 5: Local Climate

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.

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 face of Southern California was forever changed. Housing developments and shopping centers sprung up everywhere and within a few decades the central basin of Los Angeles County was virtually built out, including most of the City of Beverly Hills.

The building boom occurred during the middle of the last century resulting in over half of the community's present day apartment and condominium buildings being constructed prior to the year 1960. Additionally, many of the office and retail buildings and shops in the city were also built during this time period, which is prior to adoption of California's building codes requiring increased building design and construction for earthquake safety.

Today, approximately 92% of the City is designated in the City's General Plan for residential land uses and the remaining 8% for commercial, office and retail land uses.

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 37% of the existing housing stock was built prior to 1940, and over 60% of the existing units were built prior to 1960. In contrast, only 13% of the County's housing stock in 1990 was constructed prior to 1940. The table below provides more data on housing construction dates.

Table 6: Number of Units Built by Year

Year Structure Was Built	Number of Units		Percent of Total Units	
	Number	Margin of Error	Percent	Margin of Error
2014 or later	0	+/- 25	0.00%	+/- .15%
2010 - 2013	60	+/- 48	0.37%	+/- .30%
2000 - 2009	687	+/- 216	4.24%	+/- 1.33%
1990 - 1999	895	+/- 231	5.52%	+/- 1.43%
1980 - 1989	1,252	+/- 249	7.72%	+/- 1.54%
1970 - 1979	1,959	+/- 314	12.09%	+/- 1.94%
1960 - 1969	1,696	+/- 264	10.46%	+/- 1.63%
1950 - 1959	2,002	+/- 289	12.35%	+/- 1.78%
1940 - 1949	1,548	+/- 262	9.55%	+/- 1.62%
1939 or earlier	6,109	+/- 465	37.69%	+/- 2.87%
Total	16,208	+/- 546	100.00%	+/- 3.37%

Source: American Community Survey 2011-2015 5 year estimates, Table B25034 Year Structure Built

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.

POPULATION AND DEMOGRAPHICS

The community of Beverly Hills is expected to gradually increase as the region's population grows. Population growth, and shifts in how and where people spend their time in the City create a need to develop and update strategies, coordinate resources, and increase public awareness on a regular, on-going basis to assure that the procedures and practices the City has in place remain relevant.

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.

Table 7: General Demographic Information

Subject	#	%	Subject	#	%
Total Population	34,109	100.00	Race		
Male	15,599	45.7	White	28,112	82%
Female	18,510	54.3	Asian	3032	9%
Age			Hispanic	1,941	6%
0-19	7365	21.6%	African American	746	2%
20-44	10,324	30.2%	Other/ Two or more races	1,674	5%
45-64	9904	29%	Total		100%
65 years and over	6516	19.1%	Total Housing Units	16,394	
			Total occupied housing units	14,869	
Median Age		43.6	Owner occupied housing units	6,561	

Subject	#	%	Subject	#	%
Number of Households			Renter occupied housing units	8,308	
Family Households		8,461	Homeowner vacancy rate	--	2.2%
Non-Family Households		6,408	Rental vacancy rate	--	8.0%
Total Households		14,869	Average Household size of		
Average Household Size	2.29 persons		owner-occupied units	2.70	
1990–2000 Change in Population	+5.7%		Average household size of		
1980-2000 Change in Population	+4.4%		Renter-occupied units	1.96	
1970-2000 Change in Population	+1.1%				

Source: 2010 Census

GROWTH PROJECTIONS

The Southern California Association of Government's (SCAG) 2012 Growth Forecast Appendix projects that the City's population will be 36,300 in 2035, only a 6 % increase from 2008. The employment projection, estimated at 58,000 in 2008, is expected to reach 64,800 by 2035, a 12% increase (April 2012 Southern California Association of Governments 2012-2035 Regional Transportation Plan).

By contrast, the population of Los Angeles County is expected to increase from 9.7 million people to 11.3 million people, a 16% increase. Employment in the County is expected to increase 11% by 2035.

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.

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. Other major employers include the Beverly-Wilshire, Beverly Hilton, Peninsula and Beverly Hills hotels; the Beverly Hills Unified School District; United Talent Agency, William Morris/ Endeavor; Neiman Marcus, Saks Fifth Avenue, Barney's New York, 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 Los Angeles region. The City's daytime population has been estimated to be around 100,000 to 150,000, due in large part to the number of businesses located in the City (City of Beverly Hills Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2014). All of 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 has approximately 10% of the jobs in Los Angeles County, but only approximately 6% of all residents. This discrepancy between the higher percentage of jobs on the Westside and the lower percentage of people who reside on the Westside suggests that a substantial number of employees commute in to the Westside area from other areas in the county, and the region. This further indicates that during and after a hazard event a substantial number of employees on the Westside would not be close to home and would be dependent on some form of transportation.

The Los Angeles region is known for its vehicle traffic. Private automobiles are the dominant means of transportation in the region, including the City of Beverly Hills. However, since Beverly Hills is located in the middle of a large metropolitan area, many buses and cars travel through the City each day on their way to bordering cities and regions. As a result of the commuting nature of the Los Angeles area, there is widespread intersection congestion throughout the Westside throughout most of the daylight hours, increasing during the morning and evening peak commute periods.

Beverly Hills Metro Purple Line Extension Project

Section 1 (includes Wilshire/La Cienega station)

Map 3: Metro Purple Line Extension Section 1

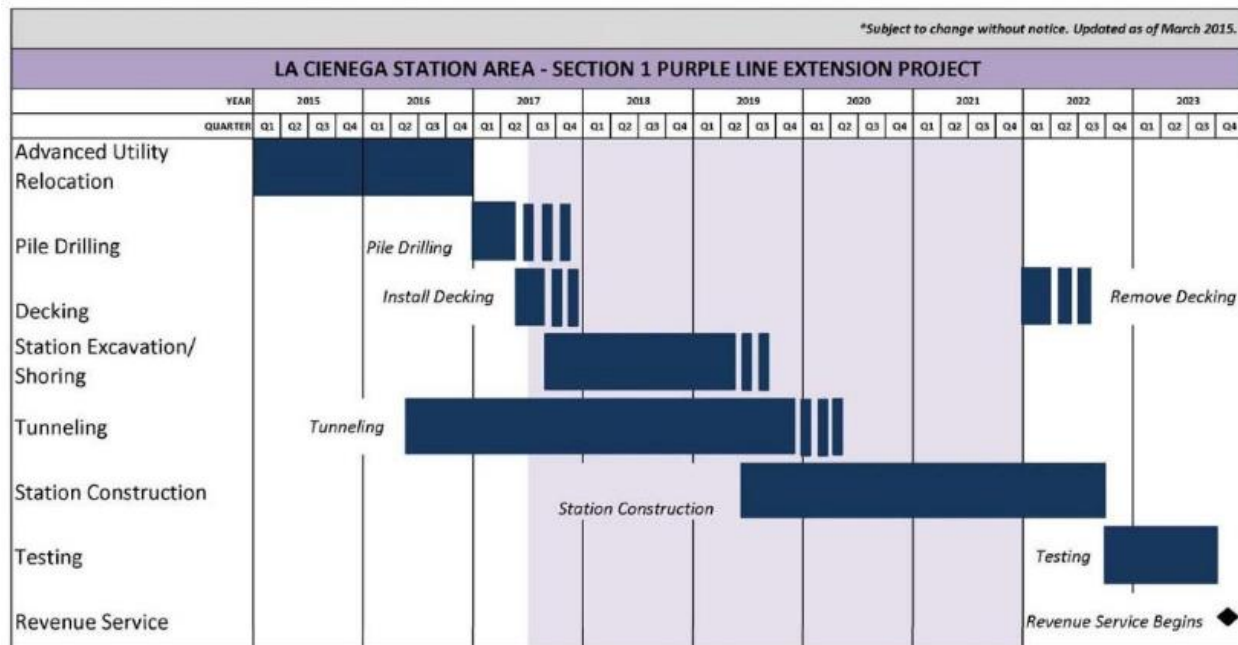


Source: The City of Beverly Hills

Section 1 of the Purple Line Extension is a 3.9 mile subway heavy rail line that will operate from its current existing at the Wilshire/Western, in the City of Los Angeles to a station at Wilshire Boulevard and La Cienega Boulevard in the City of Beverly Hills. The subway alignment is beneath Wilshire Boulevard; it will include a new station within the City limits at Wilshire and La Cienega. Two additional stations will be included in the Los Angeles area. Once completed the Purple Line will provide access from Downtown Los Angeles to Westwood.

Advanced Utility Relocation (AUR)

Image 1: Construction Schedule



Source: The City of Beverly Hills

City streets are designed to incorporate and provide utility services such as electricity, water, gas, cable, and telecommunications.

Prior to the start of construction, any utility services which could be impacted by tunnel or station construction are relocated to ensure continued service. Relocating utilities is an expected and important step in preparing for construction of tunnels and stations.

In preparation for construction of Section 1 of the Purple Line Extension in Beverly Hills (along Wilshire Boulevard between San Vicente and La Cienega Boulevards), underground utilities are being relocated. The work is being completed by a combination of contractors working for Metro, and in some cases, the utility companies.

This Advanced Utility Relocation (AUR) work began in November 2014 and is scheduled to be completed by the end of this year (December 2016). Utility related construction is in progress along Wilshire Boulevard between San Vicente Boulevard and La Cienega Boulevard, and along cross-streets north and south of Wilshire Boulevard, including La Cienega Boulevard, Hamilton Drive, Gale Drive, Hamilton Drive, and Tower Drive.

The project is in compliance with the Memorandum of Agreement executed between Metro and the City of Beverly Hills in an effort to minimize its impacts to Beverly Hills residents and businesses. This work will be completed in December 2016, in preparation for the start of the Wilshire/La Cienega Station construction in early 2017. Metro has received all required permits and approvals from the City to conduct the advanced utility relocation work.

The Purple Line Extension Section 1 is anticipated to open in late 2023. Construction on the Wilshire/La Cienega Station will begin in early 2017 with installation of construction piles along each side of Wilshire Boulevard between La Cienega Boulevard and Tower Drive and across Wilshire Boulevard at each end. The piles will support the shoring and decking that will facilitate excavation between La Cienega Boulevard and Tower Drive to accommodate the 1,000-foot long station box.

Once the decking is in place across Wilshire Boulevard, excavation for and construction of the Wilshire/La Cienega Station will continue for the next 4 years beneath the deck. Tunneling will begin in Los Angeles at the Wilshire/Fairfax Station and will conclude at the Wilshire/La Cienega Station in Beverly Hills.

Image 2: Wilshire/La Cienega Station



Source: The City of Beverly Hills

The Wilshire/La Cienega Station is located at the northeast corner of Wilshire Boulevard and La Cienega Boulevard. The station plaza will include protective canopies, two escalators to the station box and train platforms below, as well as two elevators and stairs. Below the plaza, the approximately 1,000-foot long station box will accommodate the train platforms. Given its location along two highly utilized travel corridors (Wilshire Boulevard and La Cienega

Boulevard) Metro anticipates that the station will provide seamless links to nearby destinations such as La Cienega's Restaurant Row, Beverly Center and Cedars Sinai Medical Center.

Section 2 (include the Wilshire/Rodeo station)

Image 3: Section 2



Source: The City of Beverly Hills

Section 2 of the Purple Line is currently in pre-design stage. It will run 2.5 miles and extend from La Cienega Boulevard west to Century City. The alignment will extend west under Wilshire Boulevard from La Cienega Boulevard to the Rodeo Station (which is actually located at Wilshire Boulevard and Reeves Drive). West of Reeves Drive, the alignment continues along Wilshire Boulevard until it exits the corridor and continues southwesterly to a new terminus station on Constellation Boulevard in Century City.

Pre-construction activities are currently underway for Section 2 including additional survey, geotechnical investigation and utility location verification. Utility relocation for Section 2 is scheduled to begin in early 2017.

LAND USE

The City of Beverly Hills is a built-out urban environment. A majority of the land in the City is used for housing (86%) and much of the commercial land use is concentrated in the Business Triangle and on commercial corridors that run through the City. The Civic Center area is located

north of the Business Triangle and houses City Hall, the police department, City library, and a fire station. The following map illustrates the existing land uses in the City. Some development in the City is located in identified hazard areas. This section of the Plan will describe the hazard areas and quantify the potential for loss in the event of a disaster.

Map 4: Current Land Use in the City of Beverly Hills

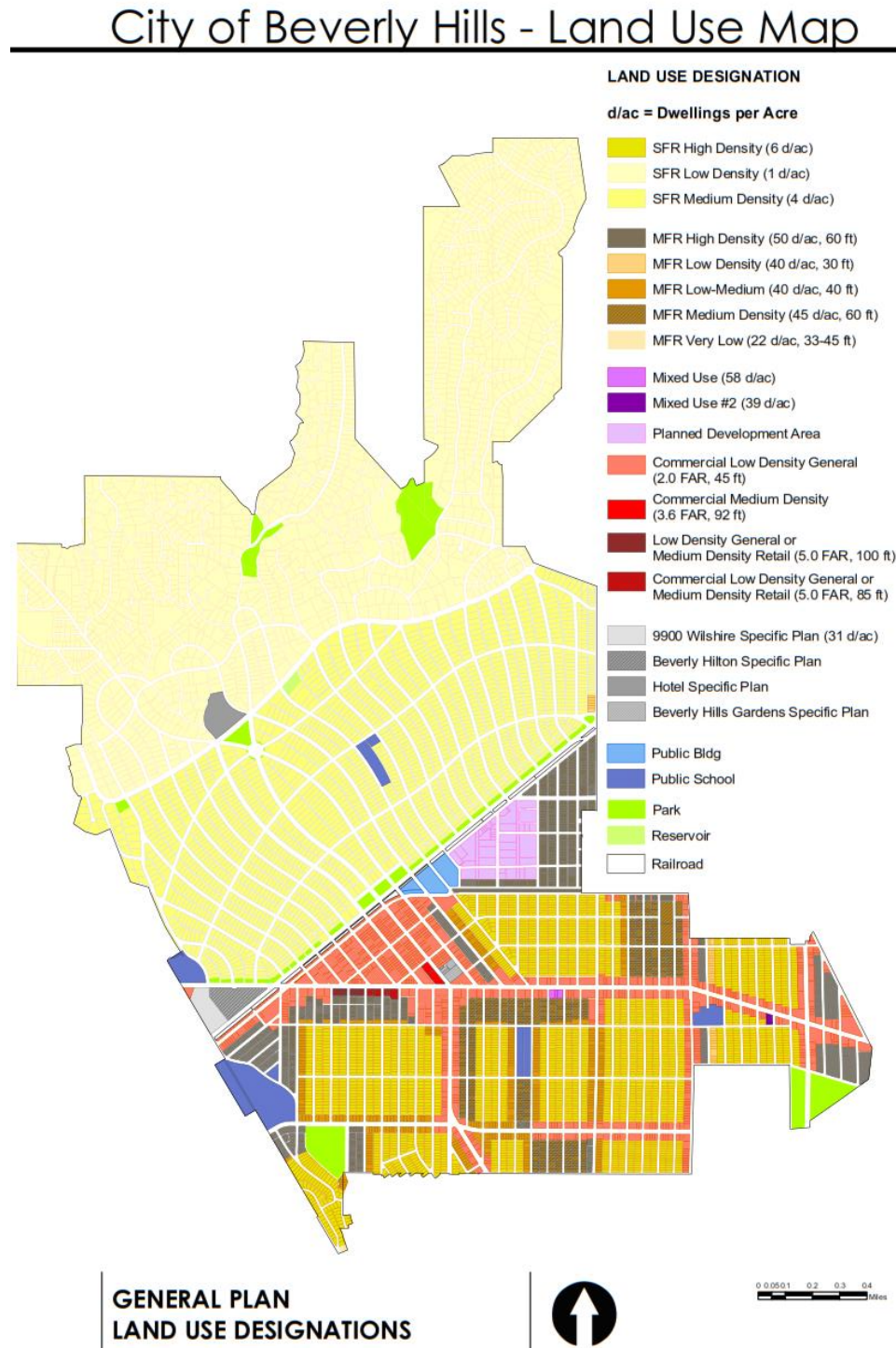


Table 8: Existing Land Uses

Existing Land Uses	Acres	Percent of City
Residential		
Low-Density SF	1,068	38.3
Medium-Density SF	731.8	26.2
High-Density SF	347.5	12.4
Very Low-Density MF	1.8	0.1
Low-Density MF	12.9	0.5
Medium-Density MF	123.6	4.4
High-Density MF	82.7	3
Subtotal Residential	2,368.6	84.9
Mixed Use		
Mixed Use	3.3	0.1
Subtotal Mixed Use	3.3	0.1
Commercial	248.8	8.9
Subtotal Commercial	248.8	8.9
Civic Center/Public Facilities		
Civic Center/Public Facilities	28.5	1
Subtotal Civic Center/Public Facilities	28.5	1
Public Schools		
Public Schools	53.5	1.9
Subtotal Public Schools	53.5	1.9
Parks/Recreation/Open Space		
Parks/Recreation/Open Space	88.5	3.2
Subtotal Parks/Recreation/Open Space	88.5	3.2
	5,582	
Total	2,791.21	100

Source: SCAG Existing Land Use 2000

HOUSING

Shelter for residents post-disaster is a critical factor in how quickly the City can recover. Understanding the housing stock and any potential risks associated with it is important when planning for a disaster. The 34,109 residents of Beverly Hills were housed in 16,394 residential units as of the 2010 Census. At that time, approximately 63% of the total dwelling units were apartments and condominiums and 37% were single family houses. Of the 14,612 occupied units, 56% were renter-occupied and 44% were owner-occupied. These percentages have stayed relatively constant for the past two decades (City of Beverly Hills Housing Element 2014-2021, data from the U.S. Census 2010).

The City's current Housing Element includes an assessment of housing needs for the period 2014-2021. For this period, the state and the local Metropolitan Planning Association (MPO - the South Coast areas MPO is the Southern California Association of Governments or SCAG) has provided the number of gross new residential housing units that the City must plan for. This

number is called the Regional Housing Needs Assessment, (RHNA). The community's Regional Needs Housing Allocation numbers are listed below. Although, the state and region require the City to plan for additional housing units, planning for those units will not result in an increase in housing density not included in the City's General Plan. The following table illustrates the housing the City must plan for based on population growth estimates.

Table 9: Regional Housing Needs Assessment 2014–2021, Beverly Hills

Income Level	Percent of AMI*	Units	Percent
Extremely Low**	0-30%	0	0%
Very Low	31-50%	1	33%
Low	51-80%	1	33%
Moderate	81-120%	1	33%
Above Moderate	120%+	0	0%
Total		3	100%

Source: City of Beverly Hills 2014-2021 General Plan Housing Element

* AMI – Area Median Income.

** An estimated half of the City's very low income housing needs (0 units) are for extremely low income households.

HOUSING COSTS

Housing costs in the City of Beverly Hills tend to be higher than surrounding communities and the County as a whole. According to the Southern California Association of Governments (SCAG) Beverly Hills profile the Median price for a home in Beverly Hills was approximately 2.1 million dollars, which is approximately 1.7 million higher than the county as a whole. Between 2000 and 2014 the median sales price increased from \$850,000 to \$2,150,000.

HOUSING DEVELOPMENT TRENDS

Since the City is built-out, in order to construct new homes, existing housing must first be demolished. Construction of new single family homes, apartments and condominiums in the City varies annually. On average, the number of new units constructed in the City between 2008 and 2015 has been about 27 new units per year. Throughout this time period however, the annual number of new units created has fluctuated. Table 10 summarizes the average number of new housing units for each of these time periods:

Table 10: Net New Housing Units per Year

Year	New Housing Units
2008	81
2009	35
2010	33
2011	46
2012	15
2013	-1
2014	-2
2015	11

Table 10 suggests that the number of new homes being constructed in the City fluctuates based on local development cycles. It is estimated that in the future the majority of net new units will be created in multi-family areas, as smaller aging multifamily buildings are replaced over time. Single family areas are built-out and it is not anticipated that there will be net new single family homes in the future.

SECTION 3: RISK ASSESSMENT

INTRODUCTION

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 Local Hazard Mitigation Action Plan meets those criteria are outlined in Table 11 below:

Table 11: Federal Criteria for Risk Assessment

Section 322 Plan Requirement	How is this addressed?
Identifying Hazards	Each hazard section includes an inventory of the best available data sources that identify hazard areas. 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, 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,

Section 322 Plan Requirement	How is this addressed?
	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.

RISK ASSESSMENT PROCESS

In 2004 the City conducted a risk assessment by soliciting City staff and community input as outlined. Because of the historical occurrence of these hazards to Southern California, the Steering Committee decided a re-evaluation of hazards was not warranted for the 2017 update and the same hazards were studied and modified for the 2010-2015 LHMAP.

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. Additionally, the effects of climate change will be addressed in each natural hazard section.

- Section 6: Earthquake
- Section 7: Wildfire
- Section 8: Terrorism
- Section 9: Flood
- Section 10: Landslide
- Section 11: Windstorm
- Section 12: Drought
- Section 13: Special Events

Community Input

In 2004, 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. A sample of the survey form is attached in Appendix C. These hazards were kept for the 2017 update, and included the addition of Cyber Terrorism, Drought, and Special Events. The 2004 hazards were:

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

Included in 2017 update:

7. Cyber Terrorism
8. Drought
9. Special Events

RISK ASSESSMENT RESULTS

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

HAZARD DESCRIPTIONS

Short descriptions for the following hazards are provided for reference. See the appropriate section for further details on the hazard.

Earthquake (Section 6)

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 a 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.

Wildfire (Section 7)

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.

Terrorism (Section 8)

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.

Flood (Section 9)

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 to 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.

Landslide (Section 10)

The City of Beverly Hills Community Development 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. An estimated 20% of the land in the City of Beverly Hills exceeds this slope threshold and has potentially unstable soil.

Windstorm (Section 11)

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. The City currently has a tree inventory of 24,874 trees. The City of Beverly Hills is known for its lush landscape and its trees are worth millions of dollars.

Drought (Section 12)

Drought is an extended period of time with below average or no rainfall for a given area. Drought can impact water availability across the state, including the City of Beverly Hills. During periods of drought, the City may have to implement water usage restrictions to increase conservation efforts. Drought is a regional hazard and will impact the area surrounding Beverly Hills as well.

Special Events (Section 13)

As a famous city located in Los Angeles County, Beverly Hills is the site of many public and private events. Surrounded by the city of Los Angeles, Beverly Hills is adjacent to West Hollywood, Santa Monica, and Bel Air, and is home to many influential businesses and residents. Due to Beverly Hills' location and reputation, the City is host to a number of events throughout the year, including the Golden Globes, the Vanity Fair Oscar Party, and the Los Angeles Marathon.

While these events are welcome, they present logistical challenges for the City and requires the use of City resources above and beyond every day needs. Therefore, it was determined that these special events be considered as a "hazard" to facilitate the City's planning response to these occasions.

OTHER DISASTERS

Through the process, other disasters were identified that pose a threat to the City of Beverly Hills. There are a number of possible disasters that can happen at any given time at any given place. The following natural disasters are not ruled out as possibilities, but are categorized as not very likely to occur in Beverly Hills.

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 from a Tsunami. State modeling data shows the City of Beverly Hills would sustain no water if a Tsunami hits the Southern California Coast, and would have little to no effect on the City.

Power Outage

Power services are provided to the city by Edison International. Power outages can occur whenever there is a severe disruption to the power lines or grid i.e. during a severe storm, an earthquake, and/or a wildfire. The City is equipped with backup 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 generators 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 are Santa Monica Airport, Los Angeles International Airport, Long Beach Airport, John Wayne Airport, Ontario Airport, and Burbank Airport. The City has recently seen increased air traffic over it however, no commercial airlines fly over the city. Most aircrafts are small airplanes or helicopters departing from or landing at Santa Monica Airport. There is no record of a major plane crash within the city, except in 1946 when a small engine plane crashed in the City.

Civil Unrest

Though Los Angeles County experienced 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 addressed 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 one location where significant amounts of hazardous material occurs is at the City's own Water Treatment Plant on 345 Foothill Road. The City has submitted a California Accidental Release Prevention (CalARP) Program document to the Los Angeles County Fire Department – Special Operations Section in 2013 detailing the City's administrative and operational programs to prevent chemical related accidents and reduce potential risks. The primary substance of concern at the facility is ammonium hydroxide 29.9%. The city currently uses a maximum of approximately 7,510 pounds (1,000) gallons of ammonium hydroxide. The City is due to revise and resubmit the next Risk Management Plan in 2018. The exposure to the City from mobile sources is slightly higher due to the types of thoroughfares within the City like Santa Monica Boulevard which crosses through the center of the City. There is no record of a hazardous material spill or incident in the City. Because of the low probability and the lack of mitigation needed, 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

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 has been identified and are displayed on Map 6. The City of Beverly Hills has mitigated or will be mitigating most of the issues identified in these government critical facilities.

ESTIMATING POTENTIAL LOSSES

Once existing structures are identified, the plan includes an estimate of losses for the identified asset. Estimating potential loss 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.

The City of Beverly Hills works to mitigate problems regarding flood issues when they arise. In the past, some areas in the City of Beverly Hills were 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 should no longer be susceptible to flooding conditions and flood related damages.

INVENTORYING ASSETS

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 City has identified a total of 175 public and private critical facilities, with an estimated valuation over \$1.358 billion in the City. Map 5 illustrates the locations of these critical facilities. Beverly Hills has a total of 2,792 acres and contains 9,946 parcels. The total value of buildings in Beverly Hills is \$29 billion. (Note: This number is based on the most recent Los Angeles County Assessor's valuation as of the date this report was written.)

FINAL VULNERABILITY

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.

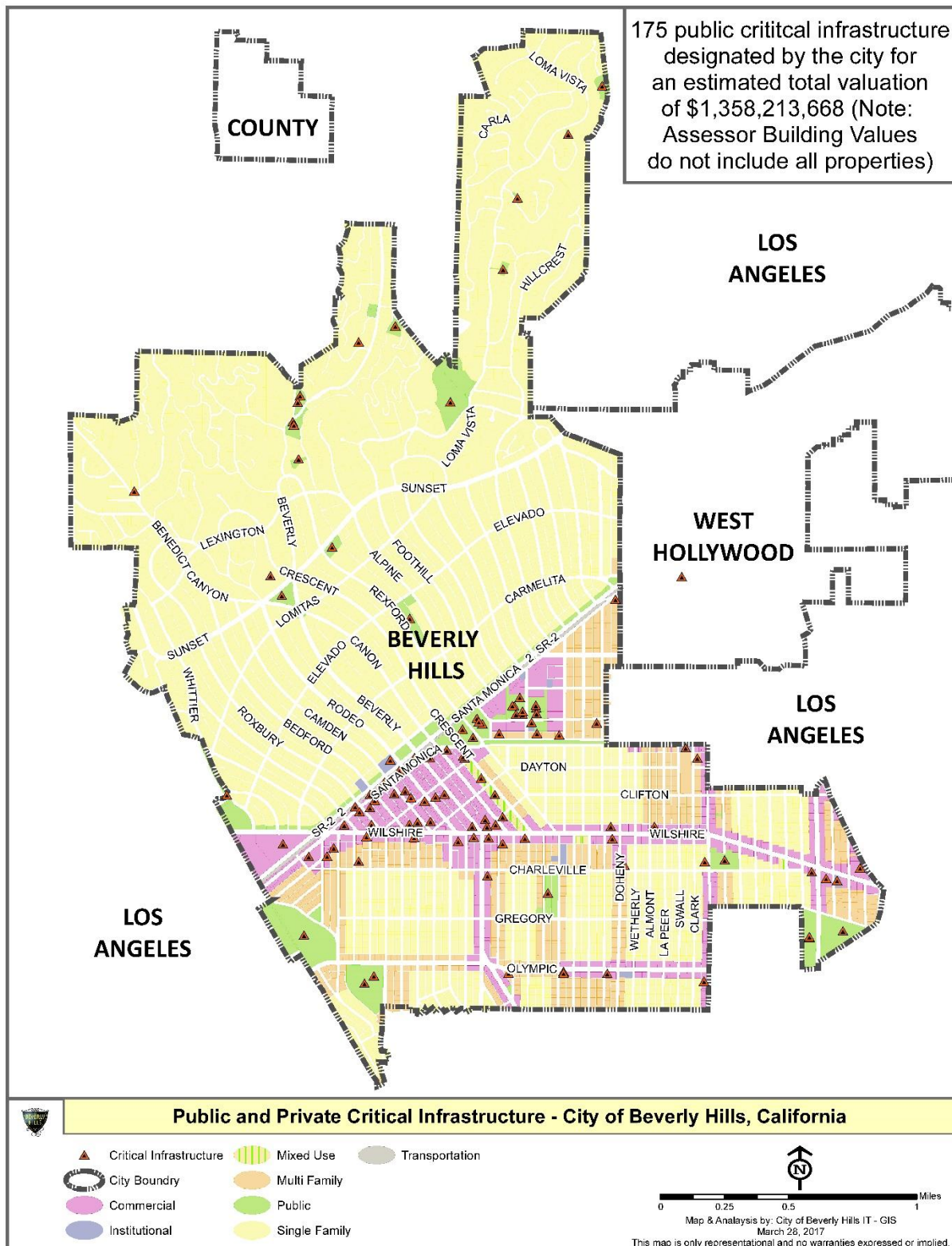
This plan provides comprehensive description of the character of City of Beverly Hills. Information includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing 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.

Map 5: Public and Private Critical Facilities



Source: The City of Beverly Hills

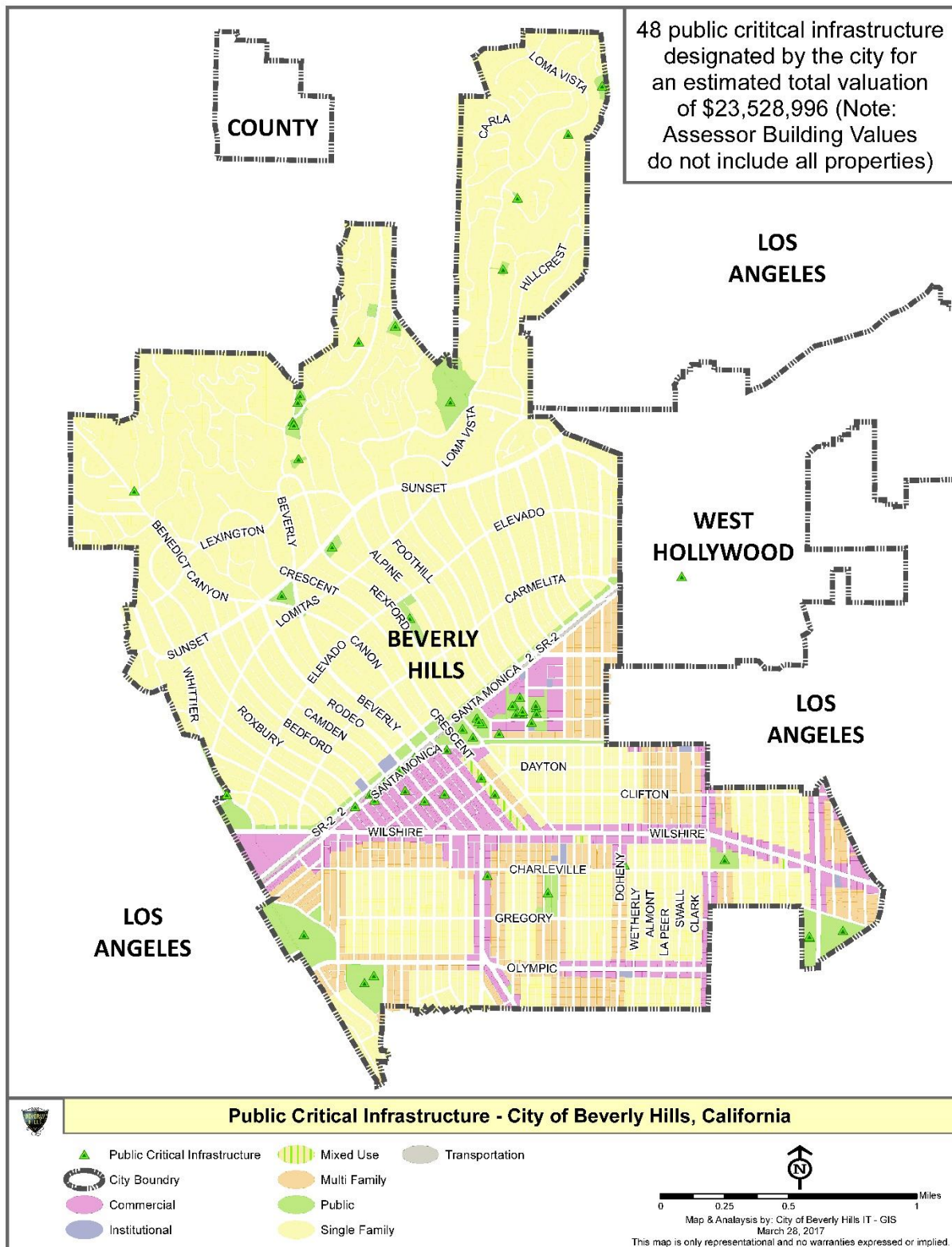
CRITICAL INFRASTRUCTURE

The following is a list of government-owned critical facilities, as identified by the Office of Emergency Management in conjunction with Community Development and Public Works. Estimated valuation for these buildings is over \$130 million dollars. Map 6 illustrates the following publicly-owned critical facilities:

Roxbury Park Size: 15,900 sq. ft. Use: Recreation facility and emergency shelter Estimated Value: \$8,343,000 Location: 471 S. Roxbury Drive, Beverly Hills, CA 90210	Fire Headquarters Station Size: 45,000 sq. ft. Facility Description: Use: Fire Operations and Administration Estimated Value: \$7,532,028 Location: 445 N. Rexford Drive, Beverly Hills, CA 90210
Beverly Hills City Hall Size: 68,000 sq. ft. Use: Administration and General Government Current Value: \$11,173,302 Location: 455 N. Rexford Drive, Beverly Hills, CA 90210	Fire Station #2 Size: 6,300 sq. ft. Facility Description: Use: Fire operations Current Value: \$875,772 Location: 1100 N. Coldwater Canyon Drive, Beverly Hills, CA 90210
Office Building Use: City owned office building Estimated value: \$22,969,000 Location: 331/333 N Foothill Road, Beverly Hills, CA 90210	Fire Station #3 Size: 14,000 sq. ft. Use: Fire operations Current Value: \$623,700 Location: 180 S. Doheny Drive, Beverly Hills, CA 90210
La Cienega Park Size: 9,400 sq. ft. Use: Recreation facility and emergency shelter Estimated Value: \$14,972,200 Location: 8400 Gregory Way, Beverly Hills, CA 90210	Police Department Size: 92,000 sq. ft. Use: Police operations and administration Estimated Value: \$21,188,790 Location: 464 N. Rexford Drive, Beverly Hills, CA 90210
Information Technology Center/Library* Size: 31,897 sq. ft. Use: Public Works operations, administration and water treatment plant, library Estimated Value: \$23,479,470 Location: 9355 Civic Center Way Beverly Hills, CA 90210	Public Works Facility Size: 43,000 sq. ft. Use: Public Works operations, administration and water treatment plant Estimated Value: \$25,750,000 Location: 345 Foothill Road Beverly Hills, CA 90210

*Note: Library and IT Center share the same parcel and building value was assessed as one.

Map 6: Public Critical Infrastructure



Source: The City of Beverly Hills

Roadways and Bridges

There are 143 miles of public streets and alleys in Beverly Hills, and no highways in the City. There are four major arterials in Beverly Hills, Sunset, Wilshire, Santa Monica, and Olympic Boulevards. These major streets have not been reconstructed or resurfaced within the last 10 years, however a reconstruction of Santa Monica Boulevard is currently underway. All the public streets and alleys are old and they are maintained under the City's Pavement Management Program.

Private Facilities

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. For example, after a disaster the hotels in the City may be a critical asset in allowing residents to remain within the City. 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 RISKS

Risk over Time

Subtle but 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.

Indirect Costs

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. Other indirect costs 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.
- Additionally, 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.

RESIDENTIAL STRUCTURES

As previously stated, the total number of residential housing units according to the 2010 U.S. Census was 16,394. Of this number, 5,995 (37%) are single family units and 10,357 (63%) are in multifamily buildings. However, single-family residential uses occupy 77% of the city's land area while multifamily uses occupy 9% of the city's land area. Multifamily areas are exclusively in the southern, flatter portion of the city.

The age and method of construction of residential buildings may shed some light on the risk of failure these structures. Table 12 illustrates the general decades in which housing structures were built in the City.

Table 12: Residential Structures by Year Built

Year Built	Estimate	Percent	Cumulative Percent
1939 or earlier	6,109	37.7%	37.7%
1940 to 1949	1,548	9.6%	47.3%
1950 to 1959	2,002	12.4%	59.7%
1960 to 1969	1,696	10.5%	70.2%
1970 to 1979	1,959	12.1%	82.3%
1980 to 1989	1,252	7.7%	90.0%
1990 to 1999	895	5.5%	95.5%
2000 to 2009	687	4.2%	99.7%
2010 to 2013	60	.3%	100.0%
2014 or later	0	0	100.0%
Total	16,208		100.0%

Source: 2011-2015 American Community Survey 5-Year Estimates, Table DP04

Almost 13,314 residential units were built before 1980. Meanwhile, 5,366 multifamily units were built before 1960, making them over 55 years old. If a cataclysmic disaster caused all multifamily structures built before 1960 to fail, more than 10,800 people, or 32% of the city's total population, would be without housing. (Methodology: Estimates were calculated using appropriate formulas based on the following assumptions: assumed population of 34,109 (2010 Census), 16,394 total housing units in city.) Multifamily residential structures have a combined valuation estimated to be \$1,336,953,323. The City considers the following types of structures at risk:

Unreinforced Masonry structures

In 1989, the City enacted a mandatory retrofit program. Each of the 90 buildings identified under this program were 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 estimated to be 500 buildings with either of these potential deficiencies. This number has been updated since the previous version.

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 300 buildings with this weakness have been identified in the City. These buildings contain approximately 1,800 dwelling units. This number has been updated since the previous version.

The City is currently conducting a survey and analysis of buildings and building records to determine the structural risks from earthquakes. The report is expected to be finished by July 2017.

HAZARDS AREAS

The City of Beverly Hills contains a significant amount of property in hazard areas. In order to better understand the potential monetary cost of recovering from a disaster, the City has estimated valuation for each hazard area. The following estimated figures are based on the City's most recent information from the Los Angeles County Tax Assessor's Office. The methodology for creating the assessments was using Los Angeles County Tax Assessor's building values, tax year 2017. Since this is hazard loss estimation, land values have not been considered. Table 13 describes the building value and critical infrastructure within hazard areas.

Table 13: Building Value in Hazard Areas

Hazard	# of Parcels	Land use	Total Building Value	Critical Infrastructure
Fire	1620	Commercial, Single Family & Public	\$ 2,102,447,522	15
Flood	0	n/a	\$0.00	0
Landslide	627	Single Family & Public	\$ 739,868,673	5
Liquefaction	3388	Commercial, Multi Family, Single Family Transportation, Institutional & Public	\$ 2,076,752,577	21

Source: Los Angeles County Tax Assessor's Office

Very High Fire Hazard Severity Zone (VHFHSZ).

Approximately 1628 parcels are located within this zone.

Estimated valuation: \$1.6 billion.

Flood Zone

The City has no designated flood zones. The City previously had two locally designated areas with flooding conditions in the southeast sector of the cities of Beverly Hills. However, the Los

Angeles County Department of Public Works in 2005 completed a massive storm water relief upgrade Holly hills Unit 7 drainage system. Several key storm drain reaches and lateral branches were been constructed which now intercept runoff in critical areas of the City and protect the entire region from a 100-year flood.

Landslide Areas

627 parcels fall within the landslide areas with an estimated total valuation of \$739 million.

Liquefaction Areas

3388 parcels fall within the liquefaction areas with an estimated total valuation of \$2 billion.

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

EXISTING PROGRAMS AND REGULATIONS

The City of Beverly Hills has many practices, ordinances, policies and programs currently in place that are meant to ensure that the community can recover quickly and effectively from any potential disaster.

Practices, Ordinances, and Policies

The following practices, ordinances and policies outline 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: 2010
Community Zoned: Yes
Established Building Codes: Yes
Building Codes Last Updated: 11/19/2016
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: Time Warner
Fire Insurance Rating: ISO Rating, Class 1
Fire Insurance Rating Date: 3/1/2015

Note: Seismic staff is currently working on an ordinance mitigation earthquake risk on soft story, multi-family dwellings and steel frame buildings.

Note: Since the last update, City Council has adopted a Disaster Reconstruction ordinance. This ordinance establishes regulations for the rebuilding of legally non-conforming buildings in the City after a City declared emergency.

Note: FEMA has classified the City under Zone “X”, which does not require mandatory flood mitigation enforcement. Properties are therefore not required to carry flood insurance.

COMMUNITY PROGRAMS

The City administers a number of programs to meet the housing needs of the community. These programs are contracted out to local service providers and include:

Handyworker Program (CDBG)

This program allows very low or low income residents in existing dwelling units to receive rehabilitation work for the upkeep of their home. Under this program, residents can also retrofit their homes to meet current seismic building standards. The Handyworker program is funded by a Community Development Block Grant (CDBG) received from Los Angeles County.

Community Assistance Grant Funding (CAGF)

Through its annual Community Services Assistance Grant Funding application, the City allocates General Fund and Transit Occupancy Tax monies to a variety of service organizations that support the City’s commitment to the provision of a social service safety net for the most vulnerable members of the community. In 2012/13, City Council allocated approximately \$375,000 in CAGF funds, with similar amounts allocated in prior years.

The City utilizes its annual CAGF allocations to fund a variety of agencies and services, including:

- CLASP (Changing Lives and Sharing Places) Homeless Outreach Team
- Emergency housing offered through PATH (People Assisting the Homeless)
- All Saints Homeless Assistance Program
- Step Up On Second
- Jewish Family Services
- The Westside Food Bank
- Saban Free Clinic
- The Maple Mental Health Counseling Center

The City has utilized these funds to support in the development of emergency housing, including New Directions’ Regional Center for Homeless Veterans, Path’s Regional Homeless Center, and Upward Bound House’s Family Shelter, which opened its doors in 2010. In fiscal year 2001/12, the City used CAGF funds to purchase an apartment unit in an affordable supportive housing project in Los Angeles provided through Step Up on Second.

This Page Intentionally Left Blank

SECTION 4: MULTI-HAZARD MITIGATION STRATEGIES

INTRODUCTION

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. Plan goals were approved during the 2004 public process. The goals were reviewed by Steering Committee in 2010 and again in 2015 and deemed appropriate and true to for the updated plan in 2015.

MISSION

The City of Beverly Hills Local Hazard Mitigation Action 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.
- Integrate the Safety Element of the General Plan into the Local Hazard Mitigation Action Plan.

Emergency Management, Resilience, and Recovery

- 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.

PREVIOUS HAZARD MITIGATION STRATEGIES

The following table summarizes the status of Hazard Mitigation Strategies for the City of Beverly Hills for the previous version of this plan, 2010-2015. The table contains the coordinating departments, the status, and the plan goals each hazard addressed. The status of each strategy is discussed in the section following this table.

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Plan Goals Addressed			
					To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Earthquake	1	Reinforce Existing Buildings. Continue to require upgrade of unreinforced masonry (URM) buildings to address any structural and nonstructural seismic deficiency of existing buildings.	Community Development	2010	X	X		X
Earthquake	2	Assistance Programs. Develop assistance programs for senior citizens who own single-family homes to seismically retrofit their homes per current safety standards. Assistance programs should include maintaining lists of approved contractors, outreach to senior citizens and education efforts.	Community Development	2015	X			X
Earthquake	3	Seismic data collection sampling stations. Work with CalTech to establish more seismic data collection sampling stations inside Beverly Hills. This will significantly improve the accuracy and details of the shakemap (ground acceleration data) which eventually allows better analysis (Virtual Beverly Hills damage assessment), planning and emergency response.	Information Technology	2012	X	X	X	X
Fire	4	Code Update. Review and update existing city codes to reflect recommendations set forth by the FireWise assessment and Joint Wild land Interface Task Force.	Community Development, Fire	2014	X	X	X	X
Fire	5	Zone 9 (Closed water Pressure Zone) Hillside Fire Protection. Increase water pressure and access to	Public Works, Fire	2015	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Plan Goals Addressed			
					To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
		water in case of an emergency 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.						
Fire	6	Wood Roof Public Education DVD. Educate Residents on the potential fire hazard regarding Wood Roofs.	Fire, Community Development	2011	X	X	X	X
Fire	7	Firewise/Waterwise Mitigation Demonstration Garden. Educate the community on what type of plants are both FireWise and Waterwise.	Fire, Public Works, Community Services	2013	X	X	X	X
Fire	8	Vegetation Management Public Education. Develop public education material to the residents regarding Vegetation Management around their homes.	Fire	2013	X	X		X
Fire	9	New Development Impacts. Review and revise the Zoning Code to reflect the general plan's policies for permitted uses and development standards.	Community Development	2015	X	X		X
Fire	10	Fire Department Access. Design private and public access drives and roadways to preserve and maintain Fire Department access to properties.	Fire, Community Development	2014	X	X		X
Fire	11	Evacuation Route. Develop and Educate Residents on a Citywide evacuation route during a disaster.	Police, OEM, Fire	2013	X	X	X	X
Fire	12	Firewise Community Board. Evaluate and implement recommendations made by the Firewise Communities Program.	Fire, OEM	2015	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Plan Goals Addressed			
					To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
Terrorism	13	Critical Infrastructure Assessment. Conduct an analysis and assessment of critical infrastructure areas and how each area interfaces with both cyber and physical components if attacked or compromised. Identify the cascade affect, if any, impacting operations should an attack or compromise occur.	Police	2011	X	X	X	X
Terrorism	14	Network Intrusion Prevention System. Obtain high level security system to prevent cyber terrorist attack on City systems and databases.	Information Technology, OEM	2011	X		X	X
Flood	15	Reservoirs Replacements and Maintenance. Update the City's Urban Water Master Plan (UWMP) and related capital improvement programs, including monitoring its water reservoirs. Adopt state-of-the-art water monitoring systems to remotely monitor the City's water usage, leaks, and ruptures. Continue to implement existing flood mitigation activities and programs.	Public Works	2013	X			X
Flood	16	Update Flood Ordinance. Remove locally designated flood ordinance.	Community Development, Public Works	2015	X	X	X	X
Landslide	17	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.	Public Works, Community Development	2013	X			X
Windstorm	18	Street Tree Master Plan Phase III. Continue the use of the STMP as a mechanism eliminating structurally	Community Services	2015	X			X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Plan Goals Addressed			
					To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
		defective trees thus eliminating potential damages to lives or property.						
Multi-Hazard	19	CERT Program Redevelopment. Study cost effective ways to offer CERT program to the community.	Fire, OEM	2011	X	X	X	X
Multi-Hazard	20	Emergency Management Exercises. Conduct periodic emergency management exercises with City personnel and surrounding jurisdictions.	OEM	Ongoing	X		X	X
Multi-Hazard	21	Building and Fire Code Updates. Continue to update the City's building and fire codes once every three years, or whenever the State updates the California building and fire codes, to reflect the highest and best available standards for seismic design and performance of buildings and to conform to State requirements.	Community Development, Fire	2014	X		X	X
Multi-Hazard	22	Inter-jurisdictional Coordination. Continue to coordinate with and support the Los Angeles County Certified Unified Program Agency (CUPA), the Los Angeles County Fire Department, and their Health & Hazardous Materials Division (HHMD) in carrying out inspections, emergency response, enforcement, and site mitigation oversight of hazardous materials and waste.	Fire	Ongoing	X	X	X	X
Multi-Hazard	23	Joint Effort in Emergency Disaster Management. Ensure that emergency disaster management is the mutual responsibility of all City Departments and a variety of stakeholders, including the Citizen Corp Program, Beverly Hills Unified School District,	OEM	2013	X	X	X	X

Hazard		Mitigation Strategy	Responsible Department (**Lead departments denoted in BOLD**)	Timeline	Plan Goals Addressed			
					To Protect Life, Property, Environment	Public Awareness	Partnerships and Implementation	Emergency Management
		private schools, local residents, and the business community.						
Multi-Hazard	24	Disaster Notification/Information Outreach. Educate community on how to seek information during a disaster - examples: website, Telephone Notification System (TNS), Twitter, local access cable channel, hotline number	OEM	2012	X	X	X	X
Multi-Hazard	25	Commissioner Emergency Training. Conduct disaster preparedness for all City Commissioners in order to have commissioners prepared to assist City during a hazard event.	OEM	2014	X		X	X
Multi-Hazard	26	Hazardous Materials Awareness. Conduct outreach to all City residents on how to properly store and secure hazardous materials so to avoid spillage and breakage during a hazard event.	OEM	2014	X	X		X
Multi-Hazard	27	Medical Facility Identification. Identify all possible medical facilities in the City that are capable of providing medical services, such as triage, during a large hazard event.	OEM	2014	X	X	X	X

STATUS OF PRIOR MITIGATION STRATEGIES

The original City of Beverly Hills LHMAP was approved in 2004 and Federal guidelines require an update every five years. Of the 27 mitigation strategies that were outlined in the City's previous 2010 - 2015 Local Hazard Mitigation Action Plan, 21 were completed, 5 are still in progress, and one project is being reconsidered. Since the City completed the majority of the hazard mitigation strategies, this renewal plan is updated to include new strategies. Where noted "On-Going", the City continues to provide these services and programs as a means of education and public awareness such as the Police Department provides Homeland Security information through the Neighborhood Watch programs.

The Safety Element of the City of Beverly Hills General Plan was updated on November 15, 2011 and addressed several existing and future mitigation strategies. The following provides a summary on the status of the 2010 mitigation strategies.

1. **Reinforce Existing Buildings.** Completed. There is an ongoing mandatory requirement to retrofit existing URMs. All identified URMs have been retrofitted.
2. **Assistance Programs.** In Progress. Assistance for seismic retrofitting of homes for seniors will be studied as a potential aspect of the existing Handyworker Program run by Community Services. Currently, Community Development is in the data gathering phase in preparation to implement this program.
3. **Seismic data collection sampling stations.** Completed. Phase 1 completed. Deployed one seismometer in 2011 which has been installed at IT data center. A second device is being procured with a plan to install it at Graystone (completion ETA December 2014). These monitoring devices will allow more expansive sampling coverage of the City, which enhances the accuracy and timeliness of earthquake information used by USGS and CBH internal applications (Shake alert emails, Virtual Beverly Hills, etc.). In tandem with this effort, IT made software application enhancements, such as a more frequent VBH-USGS data synchronization and critical infrastructure ground acceleration reports.
4. **Code Update.** Completed. The 2014 adoption of the technical codes included the appropriate recommendations.
5. **Zone 9 (Closed water Pressure Zone) Hillside Fire Protection.** Completed. Capital Assets has had an engineer draw up a plan to make the connection possible between Beverly Hills and LA County water systems and as of 10/2014, the plan is in its final review stages. Construction will be done by Beverly Hills PWS Water Department and is planned to be completed by April 2015. When it is determined who will open valve in an emergency (fire department/ water) then the appropriate department(s) will need training.
6. **Wood Roof Public Education DVD.** Completed.
7. **Firewise/Waterwise Mitigation Demonstration Garden.** Completed.
8. **Vegetation Management Public Education.** Completed.
9. **New Development Impacts.** Ongoing. Community Development is currently analyzing that zoning codes are consistent to City general Plan as it relates to hazard mitigation.
10. **Fire Department Access.** Completed.
11. **Evacuation Route.** Completed- next year strategy to develop and educate residents. Currently in strategic, inter-departmental communication developing education and outreach plan. Work plan will be completed in FY14/15.

- 12. Firewise Community Board.** Completed. "Recommendations implemented include: A. Increasing the brush clearance from 100-200 ft. in high hazard fire severity zones (north of Sunset Blvd.); B. Presented information on how to prepare for and protect from wildland fires at Fire Service Days and National Night Out.; C. Developed a public education DVD on brushfire awareness. Additionally the Firewise program is ongoing."
- 13. Critical Infrastructure Assessment.** Ongoing. Need update for PD STU.
- 14. Network Intrusion Prevention System.** Completed.
- 15. Reservoirs Replacements and Maintenance.** In Progress. Reservoir conversion by year-end 2014; UWMP 2010 complete and other activities ongoing. Reservoirs Replacement – conversion from Wonder Ware to Ignition.
- 16. Update Flood Ordinance.** Ongoing- rec'd response from FEMA in 2016 and is in progress. The study to remove all areas of the City from designated flood zones was completed and submitted to FEMA. Awaiting updated maps from FEMA. City ordinance wasn't revised.
- 17. Geotechnical Investigation.** Being Restudied. After investigations, according to the City's Capital Assets and Community Development Departments, this activity will not be completed. However, an alternative plan utilizing geotechnical data from private users is being explored.
- 18. Street Tree Master Plan Phase III.** Completed: carry over. The Street Tree Master Plan is an ongoing process with additional phases developed in accordance with the need to address decline and structural deficiency issues in the City's urban forest. These practices will continue through 2020.
- 19. CERT Program Redevelopment.** Completed. CERT was studied and reinstated for community members and businesses.
- 20. Emergency Management Exercises.** Completed. A variety of ongoing exercises have been implemented including LA County, Area A Cities, Shakeout participation, CWIRS, etc.
- 21. Building and Fire Code Updates.** Completed. The 2014 adoption of the technical codes represents the latest State Code provisions and city amendments reflecting a higher standard of seismic safety. The city will continue this process in future adoption of the 2017 codes.
- 22. Inter-jurisdictional Coordination.** Completed. The City of Beverly Hills does not regulate its own hazard materials and rely on LA County to do. BH updates records with LA County each year.
- 23. Joint Effort in Emergency Disaster Management.** Completed. This is also ongoing.
- 24. Disaster Notification/Information Outreach.** Completed: carried over. A variety of outreach methods have been completed including the development of bags, information cards, and booths at community events. Additionally, OEM will continue to educate the community through speaking engagements, using Nixle, the community newsletter, etc.
- 25. Commissioner Emergency Training.** Completed. Met with all Commissioners in EOC and provided training and information on disaster preparedness response and recovery.
- 26. Hazardous Materials Awareness.** Completed. Added into website, newsletters, and speaking arrangements.
- 27. Medical Facility Identification.** Completed. OEM documented all urgent care facilities and a variety of other medical facilities in the City. This information is documented both in the EOC and through the WebEOC.

CURRENT 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.

HOW ARE THE STRATEGIES PRESENTED?

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 strategy:

HAZARD	The hazard the strategy mitigates.		
PROJECT NAME	Name of the Mitigation project strategy.		
DESCRIPTION	Strategy description.		
ACTION ITEM	Actions required 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.		
ASSOCIATED PLAN	Correlated plans to support the development of the project.		
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 a way 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 ACTION #	1		
HAZARD	Flood		
PROJECT NAME	Stormwater Physical Protection		
DESCRIPTION	Design and construct a flood barrier around the Police Station, Library, and parking structure to prevent water from entering these area to provide physical protection against storm water exposure.		
ACTION ITEM	Prepare a Preliminary Design Report (PDR) to establish the scope of work, schedule and budget.		
COORDINATING DEPARTMENT	Public Works, Risk Management, Office of Emergency Management, Resilience and Recovery		
ASSOCIATED PLAN	Flood Emergency Response Plan (FERP)		
IDEAS FOR IMPLEMENTATION	Engage a consultant to prepare the PDR.		
TIMELINE/COMPLETION DATE	2020		
TOTAL COST	To be determined.		
FUNDING SOURCE(S)	Capital Improvement Program.		
CONSTRAINTS	Project must be prioritized and funded by City Council		
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		2	
HAZARD		Multi-Hazard	
PROJECT NAME		Risk Management Plan for Ammonium Hydroxide Release	
DESCRIPTION		Reconsider Hazardous Material Accidents in the Local Hazard Mitigation Action Plan to account for the large quantity of ammonium hydroxide used at the City’s Water Treatment Plant.	
ACTION ITEM		Continue to comply with the actions specified in the City’s Risk Management Plan (written by SCS Tracer Environmental August 16, 2013) for Public Work Services.	
COORDINATING DEPARTMENT		Fire Department, Public Works, Risk Management, Office of Emergency Management, Resilience and Recovery	
ASSOCIATED PLAN		CAL-ARP	
IDEAS FOR IMPLEMENTATION		Engage a consultant to prepare the next Risk Management Plan.	
TIMELINE/COMPLETION DATE		The last plan was submitted on August 16, 2013. The plan must be revised and resubmitted every 5 years. Next due date is 2018.	
TOTAL COST		To be determined	
FUNDING SOURCE(S)		Water Department operating budget.	
CONSTRAINTS		To be determined	
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #	3		
HAZARD	Flood		
PROJECT NAME	Improve FERP (Flood Emergency Response Plan)		
DESCRIPTION	Add the following components to FERP – A reliable flood warning method, a person who has the authority to activate the plan, a clear list of responsibilities for the key leaders, documented de-energization and shutdown procedures, actions to reduce the damage by using available resources and staff, and a recovery and cleanup plan.		
ACTION ITEM	Review Beverly Hills’ FERP.		
COORDINATING DEPARTMENT	Office of Emergency Management, Resilience and Recovery, Public Works, Risk Management		
ASSOCIATED PLAN	Flood Emergency Response Plan (FERP)		
IDEAS FOR IMPLEMENTATION	Engage a consultant for FERP review		
TIMELINE/COMPLETION DATE	To be determined		
TOTAL COST	To be determined		
FUNDING SOURCE(S)	Current department operating budgets		
CONSTRAINTS	To be determined		
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #	4		
HAZARD	Earthquake		
PROJECT NAME	Improve Sprinkler System Bracing		
DESCRIPTION	Determine the costs and benefits in protecting City Facilities to the level of Highly Protected Risk.		
ACTION ITEM	Prepare a Preliminary Design Report (PDR) to establish the scope of work, schedule and budget. Report activities include survey of existing fire protection systems and prioritization based on value and utility (i.e. City Hall).		
COORDINATING DEPARTMENT	Fire Department, Public Works, Risk Management, Office of Emergency Management, Resilience and Recovery		
ASSOCIATED PLAN	N/A		
IDEAS FOR IMPLEMENTATION	Engage a consultant to prepare the PDR.		
TIMELINE/COMPLETION DATE	2020		
TOTAL COST	To be determined		
FUNDING SOURCE(S)	Capital Improvement Program		
CONSTRAINTS	Project must be prioritized and funded by City Council.		
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		5	
HAZARD		Terrorism	
PROJECT NAME		Station/City Facilities/including Critical Facilities/Metro Line Assessment	
DESCRIPTION		Conduct an analysis and assessment of critical infrastructure areas and how each area interfaces with both cyber and physical components if attacked or compromised. Identify the cascade affect, if any, impacting operations should an attack or compromise occur.	
ACTION ITEM		Continue to coordinate with and support the Los Angeles Metro in the development of the Redline. Continue to assess and evaluate exterior and interior vulnerabilities of City structures for a possible physical, and or cyber-attack(s). Continuous evaluation of ingress/egress points (Access Control), interior access control points, monitor and evaluate current placement of CCTV cameras.	
COORDINATING DEPARTMENT		Police	
ASSOCIATED PLAN		N/A	
IDEAS FOR IMPLEMENTATION		Utilize personnel from of our City’s IT Department and the Police Department’s High Tech Task Force and Tactical Assessment and Deployment Office, to conduct the analysis and assessment. Employ a methodology utilized by the U.S. Secret Service (Critical Systems Protection Initiative – CSPI) for conducting the analysis and assessment.	
TIMELINE/COMPLETION DATE		Ongoing	
TOTAL COST		TBD (Based on PD and IT staffing levels and availability)	
FUNDING SOURCE(S)		A grant is preferred in order to reduce the cost to the City for overtime pay or compensatory time. Otherwise, staff time.	
CONSTRAINTS		Staffing. Acquiring telecommunications, fiber and private sector data as it relates to our Critical Infrastructure areas could require networking with state and federal agencies, resulting in unexpected delays due to potential security clearance requirements associated with obtaining sensitive information.	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		6	
HAZARD		Earthquake	
PROJECT NAME		Seismic Retrofit of existing wood-framed soft-story buildings	
DESCRIPTION		Perform field survey to identify potentially vulnerable wood-frame soft-story multi-story buildings. Develop a program to verify and seismically retrofit the buildings at-risk.	
ACTION ITEM		1. Complete Field Survey. 2. Develop retrofit standards based on the latest state and national standards. 3. Develop a program with timelines for completion of retrofit.	
COORDINATING DEPARTMENT		Community Development	
ASSOCIATED PLAN		Encourage voluntary compliance with the City’s Soft Story Retrofitting Standards.	
IDEAS FOR IMPLEMENTATION		Expedite review of the plans submitted for the retrofit work, issuing required permits and doing required inspections.	
TIMELINE/COMPLETION DATE		The program is anticipated to begin in 2017 and be completed by 2020.	
TOTAL COST		TBD	
FUNDING SOURCE(S)		Revenue collected from plan check and permitting process.	
CONSTRAINTS		<ul style="list-style-type: none">• Potential costs to the City to assist building owners & to track and verify retrofit compliance• Lack of State/Federal financial incentives• No current State mandatory standards• Added cost to building owner/tenant	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		7	
HAZARD		Earthquake	
PROJECT NAME		Seismic Retrofit of Existing Non-Ductile Concrete Buildings	
DESCRIPTION		Perform field survey to identify potentially vulnerable non-ductile concrete buildings. Develop a program to verify and seismically retrofit the buildings at-risk.	
ACTION ITEM		1. Complete field survey. 2. Develop retrofit standards based on the latest state and national standards. 3. Develop a program with timelines for completion of retrofit.	
COORDINATING DEPARTMENT		Community Development	
ASSOCIATED PLAN		Development of proposed ordinances aimed to mitigate the seismic risk of existing non-ductile concrete and pre-Northridge moment frame buildings.	
IDEAS FOR IMPLEMENTATION		Expedite review of the plans submitted for the retrofit work, issuing required permits and doing required inspections.	
TIMELINE/COMPLETION DATE		2021	
TOTAL COST		TBD	
FUNDING SOURCE(S)		Revenue from plan check and permitting fees	
CONSTRAINTS		Potential costs to the City to assist building owners & to track and verify retrofit compliance Lack of State/Federal financial incentives No current State mandatory standards Added cost to building owner/tenant	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		8	
HAZARD		Earthquake	
PROJECT NAME		Seismic Retrofit of existing steel frame buildings	
DESCRIPTION		Perform field survey to identify potentially vulnerable steel moment-frame buildings. Develop a program to verify and seismically retrofit the buildings at-risk.	
ACTION ITEM		1. Complete field survey. 2. Develop retrofit standards based on the latest state and national standards. 3. Develop a program with timelines for completion of retrofit.	
COORDINATING DEPARTMENT		Community Development	
ASSOCIATED PLAN		Development of proposed ordinances aimed to mitigate the seismic risk of existing non-ductile concrete and pre-Northridge moment frame buildings.	
IDEAS FOR IMPLEMENTATION		Expedite review of the plans submitted for the retrofit work, issuing required permits and doing required inspections.	
TIMELINE/COMPLETION DATE		2021	
TOTAL COST		TBD	
FUNDING SOURCE(S)		General Fund – revenue from plan check and permitting fees	
CONSTRAINTS		<ul style="list-style-type: none">• Potential costs to the City to assist building owners & to track and verify retrofit compliance• Lack of State/Federal financial incentives• No current State mandatory standards• Added cost to building owner/tenant	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		9	
HAZARD		Earthquake	
PROJECT NAME		USGS ShakeAlert	
DESCRIPTION		The City of Beverly Hills is serving as a Beta tester for an earthquake early warning system.	
ACTION ITEM		Identify existing programs that can be interfaced with ShakeAlert to build more inclusive and effective earthquake prevention programs.	
COORDINATING DEPARTMENT		The Office of Emergency Management, Resilience and Recovery, Police Department, Fire Department, Building & Safety, IT (GIS)	
ASSOCIATED PLAN		Emergency Operations Plan	
IDEAS FOR IMPLEMENTATION		Interface with phone system to send out automatic alerts within City facilities. Interface with Everbridge to send out automatic alerts to the public.	
TIMELINE/COMPLETION DATE		2017	
TOTAL COST		Unknown (but likely not much, as this will build off of existing programs)	
FUNDING SOURCE(S)		The Office of Emergency Management, Resilience and Recovery	
CONSTRAINTS		Implementation of integrating various systems will likely be a time-consuming task.	
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		10	
HAZARD		Multi-Hazard	
PROJECT NAME		Disaster Ready	
DESCRIPTION		Give City businesses the tools they need to prepare themselves to be self-sufficient in the event of a disaster. Participating businesses are encouraged to spread the word of this program to their surrounding neighbors. Businesses will be recognized for their efforts.	
ACTION ITEM		1. Present to the Chamber of Commerce. 2. Publicly announce the campaign.	
COORDINATING DEPARTMENT		The Office of Emergency Management, Resilience and Recovery	
ASSOCIATED PLAN		Emergency Operations Plan	
IDEAS FOR IMPLEMENTATION		Present to the Chamber of Commerce. Write a press release. Advertise on cable channels.	
TIMELINE/COMPLETION DATE		Website and program content are complete. Plan to present to the Chamber of Commerce by end of October 2016.	
TOTAL COST		Cost will be minimal, if any at all.	
FUNDING SOURCE(S)		The Office of Emergency Management, Resilience and Recovery	
CONSTRAINTS		Getting businesses to buy into the planning process and understanding the importance of playing their part in building a resilient community.	
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		11	
HAZARD		Flood	
PROJECT NAME		Update Flood Damage Prevention Ordinance	
DESCRIPTION		Update flood construction provisions in Beverly Hills Municipal Code to coordinate with updated FEMA maps for the City.	
ACTION ITEM		Update building requirements in municipal code.	
COORDINATING DEPARTMENT		Community Development, Public Works	
ASSOCIATED PLAN		Beverly Hills Municipal Code	
IDEAS FOR IMPLEMENTATION		Rewrite ordinance to include above changes.	
TIMELINE/COMPLETION DATE		2018	
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

MITIGATION ACTION #	12		
HAZARD	Flood		
PROJECT NAME	Greystone Reservoir, Reservoir 4A and LADWP water transition pipeline inundation and water pipe maps.		
DESCRIPTION	Greystone Reservoir and LADWP inundation and water pipe maps.		
ACTION ITEM	Hire a consultant to develop & update the Greystone Reservoir and Reservoir 4A and develop LADWP maps and inundation maps.		
COORDINATING DEPARTMENT	Public Works Engineering		
ASSOCIATED PLAN	Flood Emergency Response Plan (FERP)		
IDEAS FOR IMPLEMENTATION	Assign project and hire consultant as a Project Manager after recruitment is completed.		
TIMELINE/COMPLETION DATE	2017 - 2018		
TOTAL COST	\$200,000		
FUNDING SOURCE(S)	General Fund		
CONSTRAINTS	The main constraint is the amount of time it will require to hire a consultant to complete the project.		
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		13	
HAZARD		Flood	
PROJECT NAME		SM Blvd project alleyway flooding	
DESCRIPTION		Replace insufficient catch basins with new ones that have enough capacity and connecting it to the main storm drain line directly.	
ACTION ITEM		Replace catch basins and connect to main storm drain line.	
COORDINATING DEPARTMENT		Public Works, Community Development, Policy and Management, Community Services	
ASSOCIATED PLAN		Flood Emergency Response Plan (FERP)	
IDEAS FOR IMPLEMENTATION			
TIMELINE/COMPLETION DATE		2018	
TOTAL COST		\$500,000	
FUNDING SOURCE(S)		City Capital improvement project	
CONSTRAINTS		None	
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		14	
HAZARD		Multi-Hazard	
PROJECT NAME		Evacuation Route	
DESCRIPTION		Develop and Educate Residents on a Citywide evacuation route during a disaster.	
ACTION ITEM			
COORDINATING DEPARTMENT		Police, OEM, Fire	
ASSOCIATED PLAN		N/A	
IDEAS FOR IMPLEMENTATION			
TIMELINE/COMPLETION DATE		TBD	
TOTAL COST			
FUNDING SOURCE(S)			
CONSTRAINTS			
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		15	
HAZARD		Drought	
PROJECT NAME		Water conversation project	
DESCRIPTION		Increase water conservation campaign exposure throughout the City. Implement innovative water saving devices and programs for residents and businesses.	
ACTION ITEM		1. Provide professional large landscape audits for the highest water users. 2. Provide landscape audits by staff for all water users interested. 3. Provide awareness and assistance to all of our customers with continuous water flow/leak issues. 4. Implement seasonal water conservation outreach campaigns and get the message out to the entire City through every method. 5. Create programs and materials that create behavior change so customers always use water efficiently. 6. Update the Water Conservation Policy and Excessive Water Use Policy. 7. Work with local businesses to implement innovative water saving devices and programs. 8. Meet with and speak at various groups including the Chamber, Rotary, PTA groups, and any others. 9. Provide water education to all of the Beverly Hills Unified School District 10. Disseminate the various water conservation and tips flyers.	
COORDINATING DEPARTMENT		Public Works	
ASSOCIATED PLAN		UWMP (Urban Water Management Plan)	
IDEAS FOR IMPLEMENTATION		Survey available and feasible techniques, to implement objectives routinely throughout the City. Reach out to partner organizations and other stakeholders to increase campaign visibility.	
TIMELINE/COMPLETION DATE		2021	
TOTAL COST		TBD	
FUNDING SOURCE(S)		General Fund	
CONSTRAINTS		Staff Time and Funding	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		16	
HAZARD		Drought	
PROJECT NAME		Rehabilitation of Cabrillo Reservoir and Design Non-Potable Water Distribution System	
DESCRIPTION		Increase the City’s water supply.	
ACTION ITEM		Rehabilitate abandoned water reservoir to store non-potable water for city municipal uses. Evaluate the feasibility of expanding non-potable water source to City parks and street median. Initiate design of non-potable water transmission system and conduct city-wide non-potable water distribution network.	
COORDINATING DEPARTMENT		Public Works	
ASSOCIATED PLAN		N/A	
IDEAS FOR IMPLEMENTATION		The City of Beverly Hills is funding the project.	
TIMELINE/COMPLETION DATE		<ul style="list-style-type: none">• Reservoir rehabilitation to complete by February 2017.• Feasibility assessment for expanding non-potable water source to City parks and street median to complete by April 2017.• Design of non-potable water transmission system to complete by August 2017• Conceptual Design for Non-Potable Distribution Network to complete by August 2017	
TOTAL COST		\$3.5 Million	
FUNDING SOURCE(S)		City of Beverly Hills General Fund	
CONSTRAINTS		<ul style="list-style-type: none">• Availability and sustainability of non-potable water supply source• Structural integrity of existing abandoned reservoir• Technical requirements from Division of Drinking Water and LA County Department of Public Health on treatment requirements of non-potable water source• Constructability of non-potable distribution pipeline through one of the major thoroughfares in the City.	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		17	
HAZARD		Drought	
PROJECT NAME		Green Streets and Water Efficient Landscape on Burton Way Median	
DESCRIPTION		Complete the feasibility and design for the project then construct between FY2019-2020.	
ACTION ITEM		Complete the feasibility and design for green streets and water efficient landscape for the four median islands. Prepare plans for construction bids.	
COORDINATING DEPARTMENT		Public Works	
ASSOCIATED PLAN		EWMP (Enhanced Watershed Management Program)	
IDEAS FOR IMPLEMENTATION		The project is funded through the Capital Improvement Project (CIP) budget program.	
TIMELINE/COMPLETION DATE		FY-2019-2020	
TOTAL COST		Approximately \$3.5M	
FUNDING SOURCE(S)		City of Beverly Hills Capital Improvement Project (CIP) budget.	
CONSTRAINTS		Some of the constraints include, but not limited to utilities underneath the median may impact green streets function and landscape design. Likewise, neighborhood support for redesigning the landscape because it is a new landscape appearance for Beverly Hills community.	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation		Emergency Management

MITIGATION ACTION #		18	
HAZARD		Drought	
PROJECT NAME		La Cienega Park and Frank Fenton Field Regional Groundwater Recharge and Stormwater Project	
DESCRIPTION		<ul style="list-style-type: none">• Complete the feasibility and pre-design report in FY2017-2018.• Complete design for construction by 2021.• Construction start date: TBD	
ACTION ITEM		<ul style="list-style-type: none">• Complete the feasibility and pre-design report for the project.• Complete the design for construction by 2021• Complete an Memorandum of Agreement with stakeholders• Secure funding for project construction	
COORDINATING DEPARTMENT		City of Beverly Hills Public Works Department	
ASSOCIATED PLAN		EWMP (Enhanced Watershed Management Program)	
IDEAS FOR IMPLEMENTATION		The project will be partially funded from the Capital Improvement Project (CIP) budget.	
TIMELINE/COMPLETION DATE		FY-2021-23	
TOTAL COST		Estimated cost \$36M	
FUNDING SOURCE(S)		City of Beverly Hills Capital Improvement Project (CIP) budget. State and local grant opportunities.	
CONSTRAINTS		Securing funding is a project constraint. The project cost is estimated at \$36M. The City and its stakeholders will need to reserve funding and apply for state loans or grants in order to pay for this project. Since this is a regional project, it is also constraint to formalize a cost sharing agreement with the stakeholders. Another project constraint is the suspension or relocation of youth sports and park activities. Constructing this underneath the playing fields means suspending park activities for the community. This requires coordination with the Rec and Parks Department and the community. It will be challenging to garner public support because it will be suspending or relocating park activities.	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation		Emergency Management

MITIGATION ACTION #		19	
HAZARD		Drought	
PROJECT NAME		Shallow Groundwater Wells	
DESCRIPTION		Increase the City’s water supply.	
ACTION ITEM		Develop and construct two shallow groundwater wells.	
COORDINATING DEPARTMENT		City of Beverly Hills Public Works Department	
ASSOCIATED PLAN		N/A	
IDEAS FOR IMPLEMENTATION		Drill water wells and construct conveyance system to the City’s Reverse Osmosis Water Treatment Plant.	
TIMELINE/COMPLETION DATE		2017	
TOTAL COST		\$1.5 Million	
FUNDING SOURCE(S)		City of Beverly Hills Water Enterprise Fund	
CONSTRAINTS		Space needed to construct additional pretreatment facilities to meet water quality standards.	
PLAN GOALS ADDRESSED			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		20	
HAZARD		Multi-Hazard	
PROJECT NAME		Building and Fire Codes Updates. (GP Policy S 5.2)	
DESCRIPTION		Continue to update the City's building and fire codes once every three years, or whenever the State updates the California building and fire codes, to reflect the highest and best available standards for seismic design and performance of buildings and to conform to State requirements, including the FireWise and Joint Wild Land Interface Task Force recommendations.	
ACTION ITEM		Reflect the highest and best available standards for fire safety design. Increase the requirement for brush clearance to increase defensible space around structures in the Very High Fire Hazard Severity Zone. Incorporate the Fire Wise assessment and Joint Wild land Interface Task Force recommendations into the City's Fire Code. Continue implementation of the Hazardous Building Abatement Ordinance by encouraging property owners to reinforce and strengthen “at risk” buildings. 1. Review existing codes relevant to fire protection and prevention in the wildland interface and in high rise commercial and residential buildings. 2. Rewrite codes to reflect new recommendations 3. Submit new codes for approval 4. Enforce new codes	
COORDINATING DEPARTMENT		Community Development, Fire	
ASSOCIATED PLAN		Beverly Hills Building and Fire Codes	
IDEAS FOR IMPLEMENTATION		Survey available and feasible techniques, and amend the Building Code, Fire Code, and related codes where appropriate, to achieve the General Plan's policy objectives at least once every three years or as required by State law.	
TIMELINE/COMPLETION DATE		2017 and 2020	
TOTAL COST		\$100,000 & staff time	
FUNDING SOURCE(S)		General Fund	
CONSTRAINTS		Staff Time and Funding	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		21	
HAZARD		Fire	
PROJECT NAME		Vegetation Management Public Education	
DESCRIPTION		Educate residents on the potential wood roofs fire hazard.	
ACTION ITEM		Develop public education material to the residents regarding Vegetation Management around their homes and distribute every March.	
COORDINATING DEPARTMENT		Fire	
ASSOCIATED PLAN		Annual Brush Clearance PR Campaign	
IDEAS FOR IMPLEMENTATION		Develop educational resource for the community	
TIMELINE/COMPLETION DATE		2017-2021	
TOTAL COST		\$10,000	
FUNDING SOURCE(S)		Grants, General Fund	
CONSTRAINTS		Staff Time and Funding	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		22	
HAZARD		Multi-Hazard	
PROJECT NAME		Inter-jurisdictional Coordination	
DESCRIPTION		Continue to coordinate with and support the Los Angeles County Certified Unified Program Agency (CUPA), the Los Angeles County Fire Department, and their Health & Hazardous Materials Division (HHMD) in carrying out inspections, emergency response, enforcement, and site mitigation oversight of hazardous materials and waste. (GP Policy S 6.1)	
ACTION ITEM		The City will work with surrounding jurisdictions and agencies to coordinate and test emergency preparedness and response and recovery plans, emphasizing rapid reconstruction of the City following a disaster event. This will include exploring possible joint efforts to share emerging technology, particularly in the area of security and emergency management enhancements. (GP Policy 7.1)	
COORDINATING DEPARTMENT		Office of Emergency Management, Resilience and Recovery, Fire	
ASSOCIATED PLAN		Emergency Operations Plan	
IDEAS FOR IMPLEMENTATION		Intergovernmental Agreements	
TIMELINE/COMPLETION DATE		Ongoing	
TOTAL COST		None	
FUNDING SOURCE(S)		Staff time	
CONSTRAINTS		Time	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #		23	
HAZARD		Fire	
PROJECT NAME		Wood Roof Public Education DVD	
DESCRIPTION		Educate residents on the potential wood roofs fire hazard.	
ACTION ITEM		Develop public education DVD to educate the residents on the potential Fire Hazard with Wood Roofs	
COORDINATING DEPARTMENT		Office of Emergency Management, Resilience and Recovery, Fire	
ASSOCIATED PLAN		N/A	
IDEAS FOR IMPLEMENTATION		Develop educational resource for the community	
TIMELINE/COMPLETION DATE		2018-2019	
TOTAL COST		\$10,000	
FUNDING SOURCE(S)		Grants, General Fund	
CONSTRAINTS		Staff Time and Funding	
PLAN GOALS ADDRESSED			
X	Public Awareness	X	Protect Life and Property
X	Partnerships and Implementation	X	Emergency Management

MITIGATION ACTION #	24		
HAZARD	Cyber Terrorism		
PROJECT NAME	Cybersecurity Education		
DESCRIPTION	Education to city employees and the public on cybersecurity.		
ACTION ITEM	Identify educational opportunities available to implement and to provide training and outreach on the topic.		
COORDINATING DEPARTMENT	IT, Human Services, Police Department, Health and Safety Commission/OEM		
ASSOCIATED PLAN	Strategic Technology Plan		
IDEAS FOR IMPLEMENTATION	Provide trainings, emails, Health and Safety Commission meetings, emails, website updates, etc.		
TIMELINE/COMPLETION DATE	2019		
TOTAL COST	\$10,000		
FUNDING SOURCE(S)	General Fund		
CONSTRAINTS	None		
PLAN GOALS ADDRESSED			
The plan goals addressed by each project are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.			
X	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation		Emergency Management

MITIGATION ACTION #		25	
HAZARD		Utility Failure	
PROJECT NAME		Water Storage and Distribution	
DESCRIPTION		Develop a plan for water storage preparation and water distribution during infrastructure failure	
ACTION ITEM		Public Works subcommittee meets to develop policy recommendations on a variety of issues such as reviewing and recommending modifications to stages of emergency water storage capacity and make recommendations with staff to take back to the Commission for review of recommendations.	
COORDINATING DEPARTMENT		Public Works, OEM	
ASSOCIATED PLAN		Emergency Operations Plan	
IDEAS FOR IMPLEMENTATION		Public Works Commission to review recommendations prior to implementation.	
TIMELINE/COMPLETION DATE		2019	
TOTAL COST		In Direct Costs	
FUNDING SOURCE(S)		General Fund	
CONSTRAINTS		Staff time	
PLAN GOALS ADDRESSED			
The plan goals addressed by each project are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation		Emergency Management

MITIGATION ACTION #	26		
HAZARD	Terrorism		
PROJECT NAME	Bollard Study		
DESCRIPTION	Perform study to determine if bollards would increase security in the city by placing in strategic locations.		
ACTION ITEM	1. Critical Infrastructure Analysis 2. Study Pros and Cons 3. Cost Analysis 4. Make Recommendations		
COORDINATING DEPARTMENT	Police Department		
ASSOCIATED PLAN	N/A		
IDEAS FOR IMPLEMENTATION	Hire consultant or in-house study.		
TIMELINE/COMPLETION DATE	2020		
TOTAL COST	Indirect costs to \$25,000		
FUNDING SOURCE(S)	General Fund		
CONSTRAINTS	Lack of city staff or time due to current large projects.		
PLAN GOALS ADDRESSED			
The plan goals addressed by each project are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.			
	Public Awareness	X	Protect Life and Property
	Partnerships and Implementation		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 of California Emergency Management Agency (Cal EMA) and the Federal Emergency Management Agency (FEMA), 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.

All projects were evaluated and prioritized based on the following categories in Table 14. All projects below reflect a project staff deemed worthy the mitigation cost, effect and benefit and for all purposes plan to complete. They have been determined in the cost analysis that the project mitigation benefit and expected recovery savings outweigh the cost of the project itself. 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.

Table 14: 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	Reinforce Existing Buildings	Very High	Difficult	Mixed	Funded	High
Earthquake	Assistance Programs	Very High	Easy	Mixed	Funded	High
Earthquake	Seismic data collection sampling stations	Medium	Medium	Mixed	Unfunded	Low
Fire	Code Update	Medium	Moderate	Moderate	Funded	High
Fire	Zone 9 (Closed water Pressure Zone) Hillside Fire Protection	Very High	Moderate	Mixed	Funded	Very High
Fire	Wood Roof Public Education DVD	Medium	Moderate	High	Funded	High
Fire	Firewise/Waterwise Mitigation Demonstration Garden	Low	Difficult	High	Unfunded	Medium
Fire	Vegetation Management Public Education	High	Easy	High	Unfunded	Medium
Fire	New Development Impacts	Medium	Difficult	Mixed	Funded	High
Fire	Fire Department Access	Very High	Difficult	High	Funded	Very High
Fire	Evacuation Route	Very High	Easy	High	Unfunded	Medium
Fire	Firewise Community Board	Low	Moderate	High	Unfunded	Low
Terrorism	Critical Infrastructure Assessment	Very High	Difficult	High	Funded	Very High
Terrorism	Network Intrusion Prevention System	Medium	Easy	High	Funded	Very High
Flood	Reservoirs Replacements and Maintenance	Very High	Moderate	Mixed	Funded	Very High
Flood	Update Flood Ordinance	Low	Easy	Low	Funded	Low
Landslide	Geotechnical Investigation	High	Moderate	Mixed	Unfunded	Medium
Windstorm	Street Tree Master Plan Phase III	Low	Moderate	Low	Funded	Medium
Multi-Hazard	CERT Program Redevelopment	Medium	Moderate	High	Unfunded	Medium
Multi-Hazard	Emergency Management Exercises	High	Moderate	Mixed	Funded	High
Multi-Hazard	Building and Fire Code Updates	Medium	Moderate	Mixed	Funded	Very High
Multi-Hazard	Inter-jurisdictional Coordination	High	Moderate	Mixed	Funded	Low
Multi-Hazard	Joint Effort in Emergency Disaster Management	High	Moderate	Mixed	Funded	Low
Multi-Hazard	Disaster Notification/Information Outreach	Medium	Easy	Mixed	Funded	High
Multi-Hazard	Commissioner Emergency Training	Low	Easy	High	Funded	High
Multi-Hazard	Hazardous Materials Awareness	Medium	Easy	Low	Unfunded	Low
Multi-Hazard	Medical Facility Identification	Medium	Easy	Mixed	Partial	Medium
Terrorism	Cybersecurity Education	Low	Easy	High	Funded	Medium
Utility Failure	Water Storage and Distribution	Very High	Medium	High	Funded	High
Terrorism	Bollard Study	Medium	Moderate	Mixed	Unfunded	Low

Source: City of Beverly Hills Local Hazard Mitigation Action Plan, 2017-2022

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 and their priorities were studied using some or all of the methods discussed above. Priorities were decided based on these methods. All projects or strategies were deemed to be worthwhile before they were included in this Plan. Table 14: Prioritization and Benefit Analysis of Mitigation Strategies provides an overview of all strategies, and ranks the following the effect on overall risk to life and property, ease of implementation, political and community support, and overall priority. This table also shows the funding status. The table was completed by the Steering Committee and Project Coordinators in multiple meetings. The Department responsible for the hazard took the initiative in ranking and prioritizing the strategies. These rankings and prioritizing were then extensively discussed with the group and the Commissions and the final priority and analysis was agreed upon.

FUTURE STRATEGIES

Several of the preceding mitigation strategies will inherently create future mitigation projects. In addition, the City of Beverly Hills Office of Emergency Management, Resilience and Recovery is consistently working with various City departments to analyze existing, create new, and implement current mitigation programs and projects. Mitigation strategies are evaluated and included in the plan maintenance. Incorporating hazard mitigation with other community projects is 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 Local Hazard Mitigation Action 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, EVALUATING, AND IMPLEMENTING THE PLAN

The City Council will be responsible for adopting the City of Beverly Hills Local Hazard Mitigation Action Plan 2017-2022. 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, Resilience, and Recovery will be responsible for submitting it to the State Hazard Mitigation Officer at California Emergency Management Agency. The Governor's Office of Emergency Management, Resilience and Recovery 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. The updated Local Hazard Mitigation Action Plan will be significant in the future growth and development of the community. The Beverly Hills Local Hazard Mitigation Action Plan will go to council for approval on XXXXX, 201x.

The Hazard Mitigation Steering Committee is in charge of monitoring, evaluating, and implementing this Plan. The departments on the Hazard Mitigation Steering Committee include:

- Emergency Management, Resilience, and Recovery
- Public Works
- Beverly Hills Fire Department
- Beverly Hills Police Department
- Community Development
 - Planning
 - Building and Safety
- Information Technology (IT)
 - Geographic Information Systems (GIS)
- Risk Management

Monitor

- **How:** Mitigation actions identified in the 2017 LHMAP plan will be reviewed by the Hazard Mitigation Steering Committee. Departments in charge of the mitigation actions will present the current status of the project, as well as any possible or actual implementation issues.
- **When:** Meetings will be held annually.
- **By Whom:** The City of Beverly Hills Hazard Mitigation Steering Committee will lead the monitoring effort, led by the Director of Emergency Management, Resilience, and Recovery.

Evaluate

- **How:** Following the annual monitoring meeting, the Hazard Mitigation Steering Committee will determine the effectiveness of identified mitigation actions and adjust as necessary. The Steering Committee will also consider if the plan continues to align with the City's overall goals in light of any events that have occurred since the previous meeting.
- **When:** Meetings will be held annually, or as needed following a major event.
- **By Whom:** The City of Beverly Hills Hazard Mitigation Steering Committee will lead the evaluation effort, led by the Director of Emergency Management, Resilience, and Recovery.

Update

- **How:** The Steering Committee will pursue the same update process as was followed in the 2017 update. Previous mitigation actions will be evaluated, new mitigations will be added, and the plan will be updated to reflect the current goals and priorities
- **When:** The Beverly Hills LHMAP will be updated every 5 years. The next update will be completed in 2022.
- **By Whom:** The City of Beverly Hills Hazard Mitigation Steering Committee will lead the update effort, led by the Director of Emergency Management, Resilience, and Recovery.

Continued Public Involvement

City of Beverly Hills is dedicated to involving the public directly and indirectly in the review and updates of the Local Hazard Mitigation Action 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 and public locations.

To ensure the City of Beverly Hills continues to include its residents in the LHMAP process, the City has decided to maintain an ongoing Resident Recommendation Program. This allows residents to voice their concerns and the City to continue to meet the needs of its community. At its core, the Resident Recommendation Program is a survey-based feedback program. The City has decided to distribute this survey via the following methods:

- An online survey link:
 - Available 24/7 on the Office of Emergency Management, Resilience, and Recovery website; and,
 - Promoted via all communication channels following a disaster event.
- Hard copy surveys:
 - Available in the Office of Emergency Management, Resilience, and Recovery during normal business hours; and
 - Distributed at events or local public locations on an ad hoc basis.

The City may determine to add or remove any method or alter the survey questions at their discretion. An example of the survey questions that may be posed include:

1. Have you been impacted by one of the following threat(s) or hazard(s)? Please select all that apply.
 - a. Earthquake
 - b. Wildfire
 - c. Terrorism
 - d. Flood
 - e. Landslide
 - f. Windstorm
 - g. Drought
 - h. Special Events
 - i. Other (Please explain): _____
2. What threat or hazard are you most concerned about? Please select ONE.
 - a. Earthquake
 - b. Wildfire
 - c. Terrorism
 - d. Flood
 - e. Landslide
 - f. Windstorm
 - g. Drought
 - h. Special Events
 - i. Other (Please explain): _____
3. Do you have any ideas on how to mitigation the threat(s) or hazard(s) you are most concerned about? Mitigation means to reduce the severity of something; for example, a mitigation action to protect against wildfire is to remove dry vegetation around your home.
4. Is there anything else you'd like the Office of Emergency Management, Resilience, and Recovery to know?

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, no longer exists but the Health & Safety Commission was created in 2008 and can be used to facilitate the public process in the future.

The five-member commission is appointed by the City Council to maintain and improve the overall health and safety of the community. The Health and Safety Commission is the advisory to the City Council and other officials and staff of the City. The Commission has the following purposes and responsibilities:

1. Increase Public Awareness. Promote and broaden community awareness of health and safety issues, including issues of public health and welfare, healthy lifestyles, mitigation of safety risks and hazards, the importance of disaster preparedness (hereafter "Health and Safety Issues") and encourage citizen participation in efforts aimed at promoting Health and Safety Issues.
2. Inform the Public. Educate and inform members of the community regarding Health and Safety Issues and risk avoidance through various means, including but not limiting to,

public discussion, website publications and postings, community outreach, sharing of information and by assisting at and supporting City-sponsored activities and programs which promote Health and Safety Issues.

3. Provide a Public Forum. Provide the community with a public forum within which members of the general public can discuss and/or comment on Health and Safety Issues.
4. Provide Recommendations. Recommend strategies aimed at improving the health and safety of the City, including as directed by the City Council, or as requested by members of the general public, and/or which relate to Health and Safety Issues.
5. Support Efforts Aimed at Disaster Preparedness, Prevention, and Mitigation. Response and Recovery. Support the work of all City Departments before, during and after a medical, natural or man-made disaster, and strengthen ties with the community's disaster related stakeholders.
6. Recognize Achievement. Honor individuals, businesses or groups that have demonstrated leadership in the field of health and safety, have promoted Health and Safety Issues and/or have otherwise made a contribution to the missions of the Health and Safety Commission.

The Director of Emergency Management, Resilience, and Recovery 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. Additionally, 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 Local Hazard Mitigation Action Plan, and the Hazard Mitigation Steering Committee will take responsibility for plan implementation. The Office of Emergency Management, Resilience and Recovery 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 Local Hazard Mitigation Action 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.

EVALUATING AND UPDATING THE PLAN AND THE FORMAL REVIEW PROCESS

The City of Beverly Hills Local Hazard Mitigation Action 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, Resilience and Recovery 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. In regards to public awareness, the City of Beverly Hills Office of Emergency Management, Resilience and Recovery offers the community numerous emergency preparedness and safety programs, including Community and Business Emergency Response Training, CPR classes, Disaster Communication System (DCS) training, Crime Prevention and Neighborhood Watch, Fire Service Day, Introduction to Disaster Preparedness classes, National Night Out, Woofstock, Earth Day, and booths at the Farmers Market.

Online, the Office of Emergency Management, Resilience and Recovery offers several videos to help motivate the public to be prepared, including an Emmy Award- winning video on earthquake survival. Disaster planning videos include the following topics:

<ul style="list-style-type: none"> • Earthquake Survival • Resiliency • School Pickup • Meeting Place • Cell Phones • Emergency Food • Advanced Planning • Family Preparedness • Stay Aware 	<ul style="list-style-type: none"> • Turn It Down • Share the Road • Move It or Lose It • Protect Your Identity • Prevent the Bite • Watch Your Walk • Fight the Flu • Protect Your Pet • Fight the Bite
--	---

On *Beverly Hills Television Channel 10*, the Office of Emergency Management, Resilience and Recovery implements "Dangerstoppers," an instructional series about the importance of disaster preparedness. In this series, the Office of Emergency Management, Resilience and Recovery presents vital information on preparing your home, business, and loved ones for an earthquake or other health and safety emergencies. Community members learn what to do before, during, and after a disaster. Also, the Beverly Hills "In Focus" and Beverly Hills "This Week" cable program feature a variety of programs.

This Page Intentionally Left Blank

PART II: HAZARD SPECIFIC INFORMATION

SECTION 6: EARTHQUAKE

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why Are Earthquakes a Threat in the City of Beverly Hills?	108
History of Earthquake Events in Southern California and Beverly Hills	109
Probability of an Earthquake in Beverly Hills	113
Causes/Characteristics of Earthquakes in Southern California and Beverly Hills	113
Earthquake Hazard Identification	117
Risk Analysis	117
What Is Susceptible to Earthquakes?	122
Existing Mitigation Activities	124

Why Are Earthquakes a Threat in 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 a 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 in 1999 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 7 shows a seismic hazard map of the Los Angeles Area.

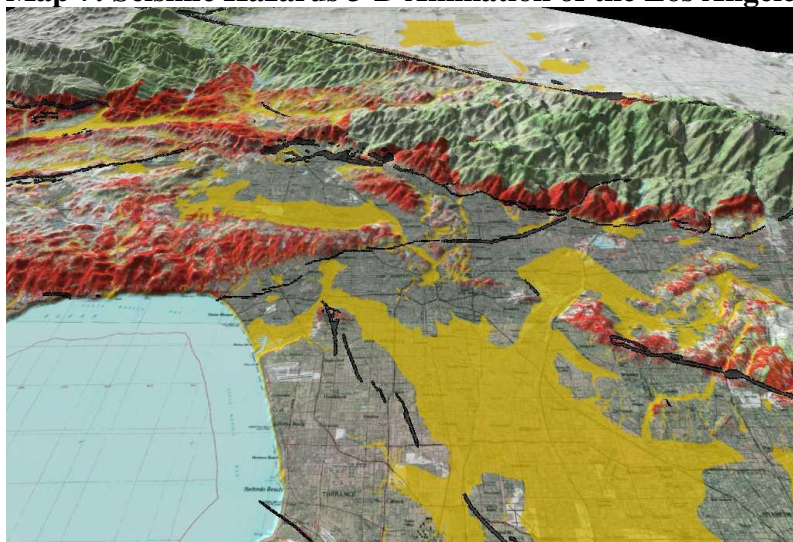
Risk Rating: High

Due to Beverly Hill's proximity to multiple active faults (including the San Andreas Fault), the frequent and widespread nature of the hazard, and the potential for severe damage and injury, Beverly Hills is at high risk for earthquakes.

Climate Change Impact

Climate change is not currently known to have a direct impact on earthquake activity. There is some research that suggests severe storms and landslide events (which may be impacted by climate change) may alter the pressure on fault lines, thus indirectly impacting earthquake activity. However, this potential link has not been proven causative.

Map 7: Seismic Hazards 3-D Animation of the Los Angeles Area.



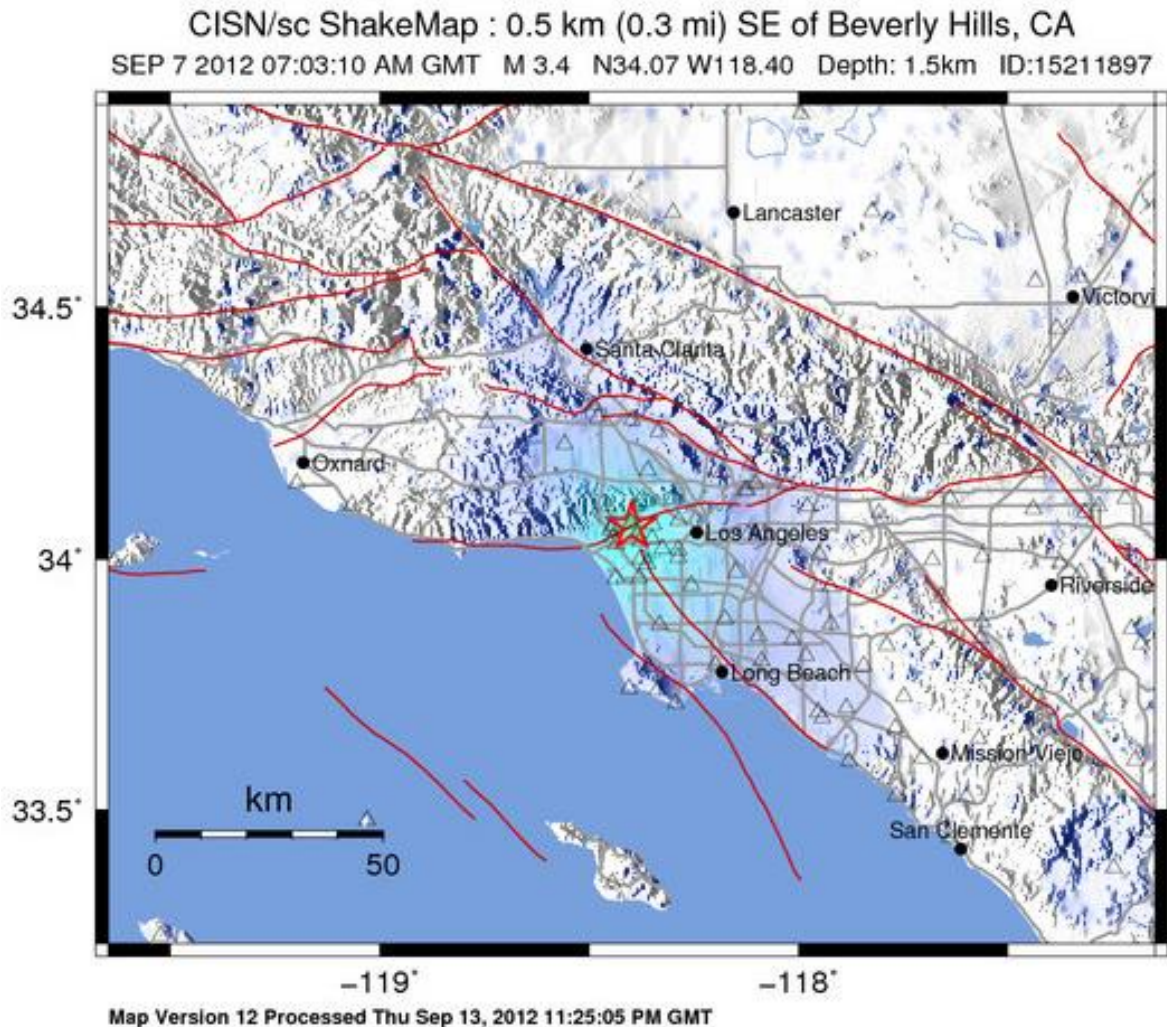
Source: California Department of Conservation

History of Earthquake Events in Southern California and Beverly Hills

The most recent notable seismic activity near City of Beverly Hills was on September 7, 2015. This event was not significant. The moderate size (M3.4) earthquake occurred 0.3 miles South East of Beverly Hills (see Map 8).

This earthquake was widely felt throughout the Los Angeles Basin and in parts of San Fernando Valley and was well recorded by the USGS. 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 8: M3.4 Beverly Hills Earthquake - Friday, September 7, 2015



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

Scale based upon Worden et al. (2011)

Source: USGS Shakemap sc14601172

There has been no significant earthquake event in the City of Beverly Hills or in Southern California since the 1994 Northridge earthquake, which struck the San Fernando Valley at 4:31 A.M. on Monday, January 17, 1994. In addition to this moderate but very damaging 6.7 earthquake, thousands of aftershocks occurred in the following days and weeks, 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. Of the 66,500 buildings 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. The 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 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 hundreds of deaths and thousands of injuries.

Table 15: Magnitude 5.0 or Greater 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

Date	Time (local)	Location	Magnitude
06/28/1992	4:57 am	Landers	7.3
06/28/1992	8:05 am	Big Bear	6.3
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
04/04/2010	3:40 pm	Mexicali, Mexico	7.2
12/14/2012	10:36 am	Off So. California Coast	6.1
07/29/2008	11:21 am	Chino Hills	5.5
03/28/2014	9:09 pm	Brea	5.1

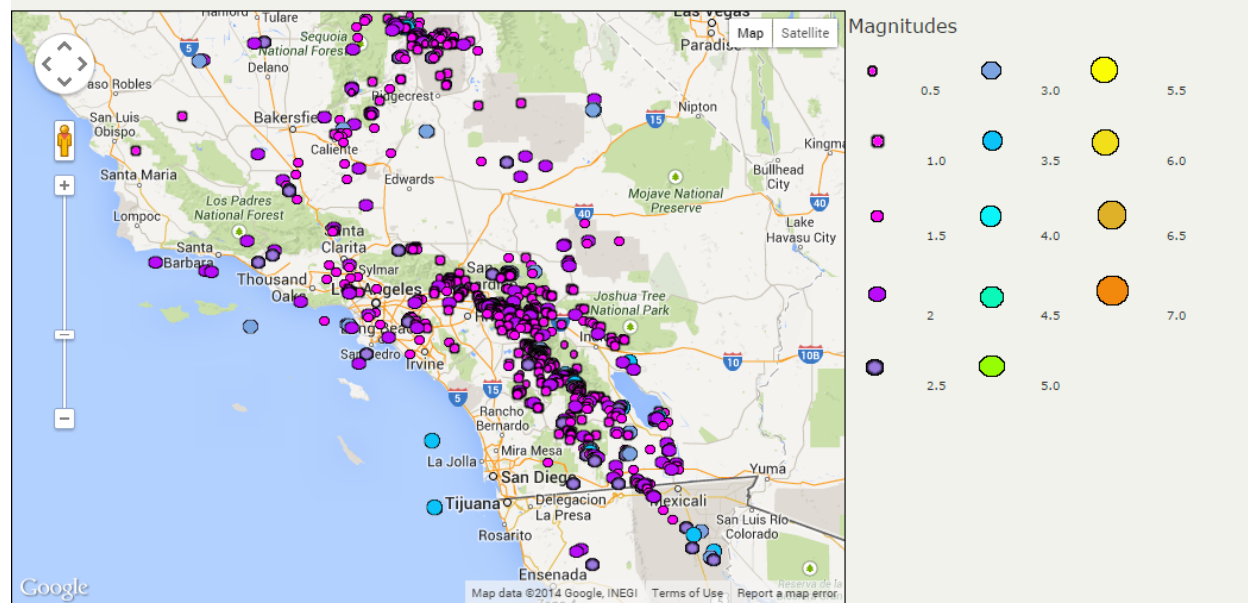
Source: Southern California Earthquake Data Center

The most recent large magnitude earthquake near Southern California was recorded on April 4th, 2010. The United States Geological Survey reported that the 7.2 quake was caused by two rock masses grinding and scraping together along a roughly 45-mile zone. The epicenter was in near Mexicali, Mexico, approximately 240 miles south of Beverly Hills. The earthquake was of such magnitude it was felt as far away as southern Utah and Portland, Oregon. The City reported no loss of life or property.

There are hundreds of earthquakes in Southern California every month. A few are damaging, but most are not even felt. As an example, the following map and chart show the number of earthquakes in Southern California in July, 2014.

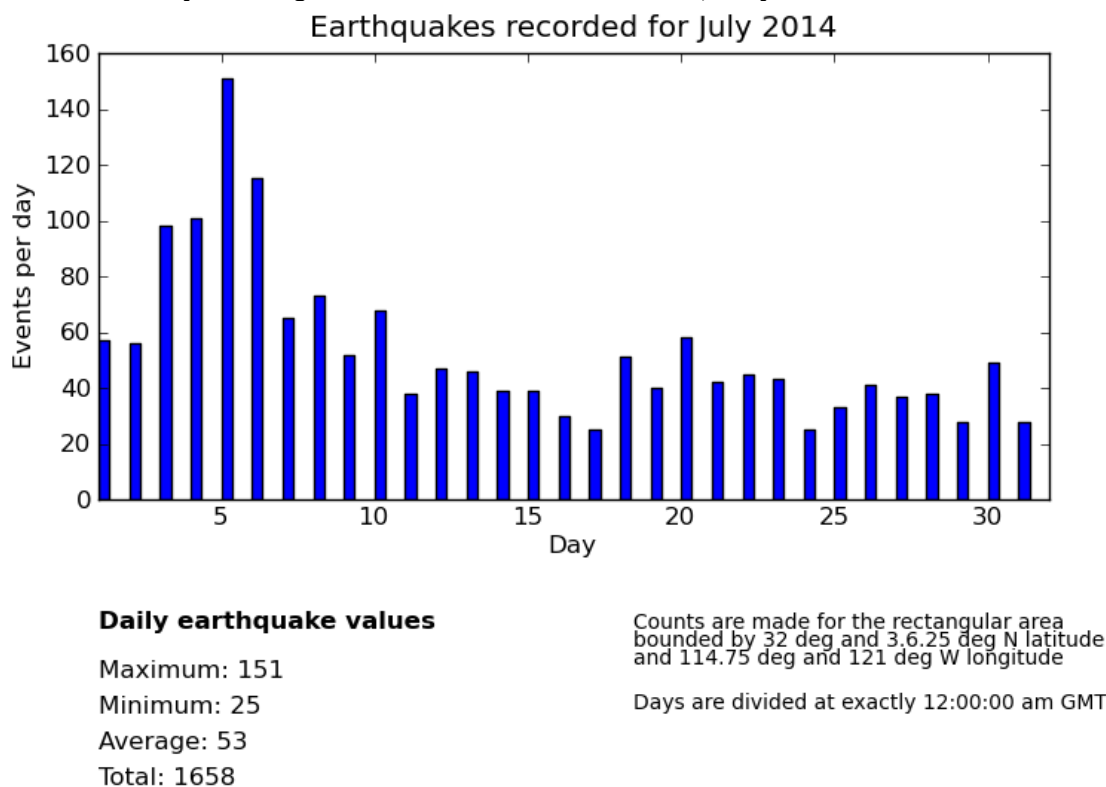
Map 9: Earthquakes in Southern California in July 2014 Monthly seismicity report for 7/2014

Earthquakes : 1658



Source: Southern California Earthquake Data Center

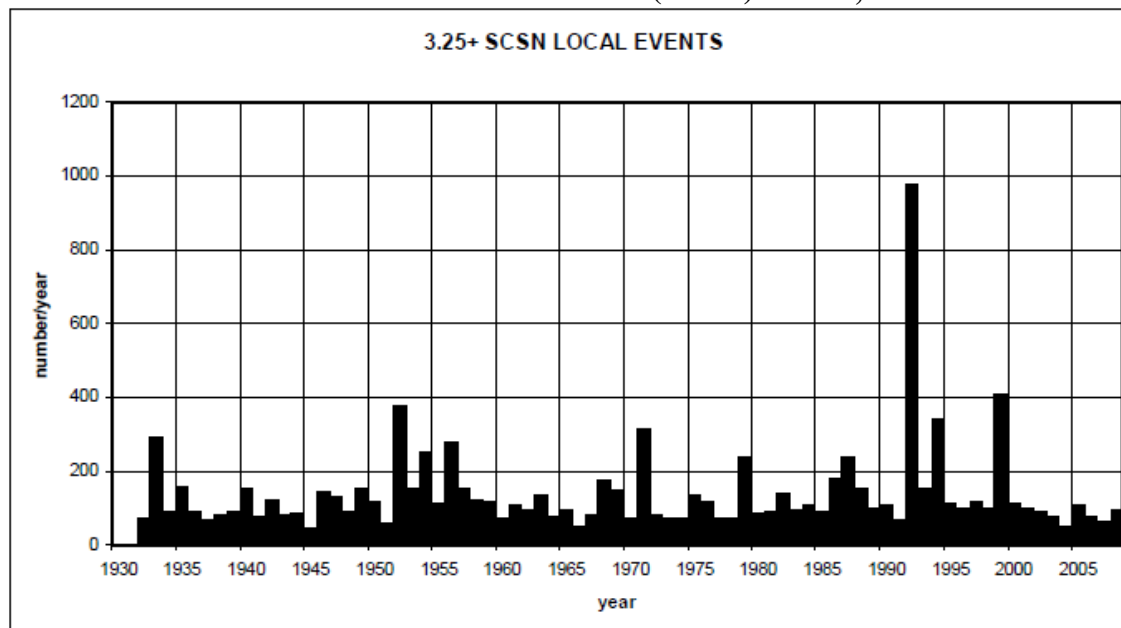
Chart 1: Daily Earthquakes in Southern California, July 2014



Source: Southern California Earthquake Data Center

The following chart shows historical Southern California seismic events of 3.25 magnitude or greater from 1930 – 2009.

Chart 2: Southern California Seismic Network (SCSN) Events, 1930 -2009



Source: Kate Hutton, Seismological Laboratory, Caltech

Probability of an Earthquake in Beverly Hills

Due to Beverly Hills' proximity to active faults, the area is guaranteed to be impacted by future earthquakes, however the strength and timing of these earthquakes is unknown.

Causes/Characteristics of Earthquakes in Southern California and Beverly Hills

The City of Beverly Hills' exposure to geologic and seismic hazards is directly related to its proximity to active faults. Earthquakes in Southern California can be mainly 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 1,100 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 fault complexity 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 view below. The 1994 Northridge earthquake (magnitude 6.7) occurred on one of these numerous thrust faults.

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.

However, 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 one may consider using to identify apparent problems with seismic activity 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, 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

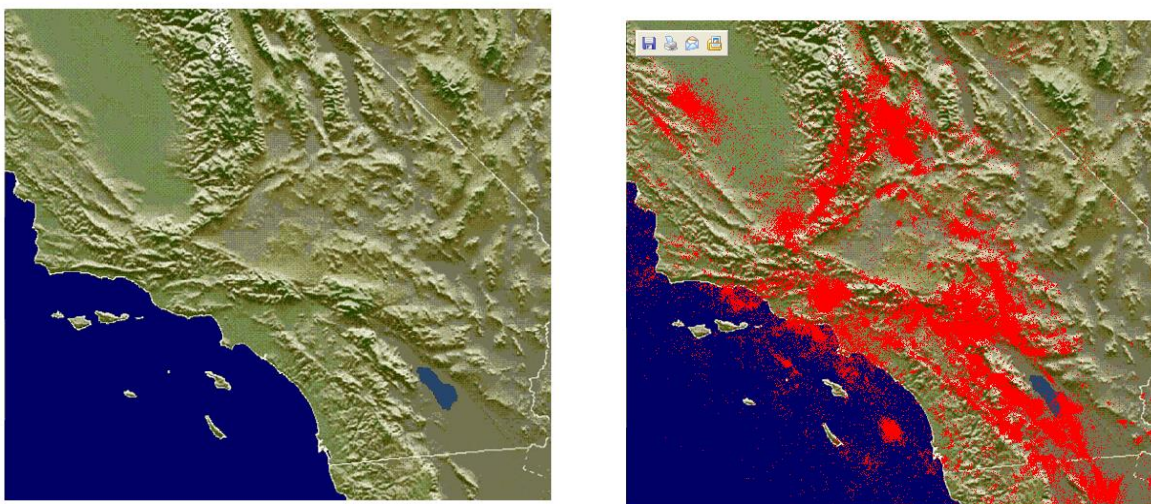
The Santa Monica Mountains, located in the northern portion of the City, are in the Transverse Ranges Physiographic province. The coastal plain of the Los Angeles Basin, located in the southern portion of the City, is part of the peninsular Ranges Physiographic Province. The majority of the City lies 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 Boulevard and La Cienega Boulevard and the highest point is 1,400 feet above sea level along Carla Ridge Drive in the Trousdale Estates area.

Areas north of Sunset Boulevard 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 10: Topography of the Los Angeles Basin

(Red dots represent earthquake occurrences from 1932 – 1996)



Source: Southern California Earthquake Data Center

The City of Beverly Hills is located along the boundary between the Transverse Ranges and Peninsular Ranges physiographic of southern California. The Transverse Ranges consist of a complex series of elongated, 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, and Raymond fault (located to the east of the City in Pasadena area).

The Puente Hills Fault

This fault system runs under downtown Los Angeles and could generate an earthquake of magnitude 7.0 or greater. The fault snakes underground for at least 25 miles, from 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/year, this fault is capable of producing a 7.0 magnitude earthquake.

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, an earthquake occurred which registered a magnitude of only 5.9, several buildings in Beverly Hills sustained damage, including one of the City's parking structures. The most recent seismic event along this fault occurred on March 16th, 2010, a moderate size (M3.2) earthquake. This event was not significant and caused no reported damage or injuries in the City of Beverly Hills.

The San Andreas Fault

Undoubtedly the most well-known fault in California, the San Andreas Fault, is located approximately 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.

The 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 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.

Risk Analysis

Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time (Burby, 1998). 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 (FEMA HAZUS, May 2001). The HAZUS software is available in the Beverly Hills Information Technology Department.

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. Nevertheless, 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.

Earthquake Related Hazards in Beverly Hills

The 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

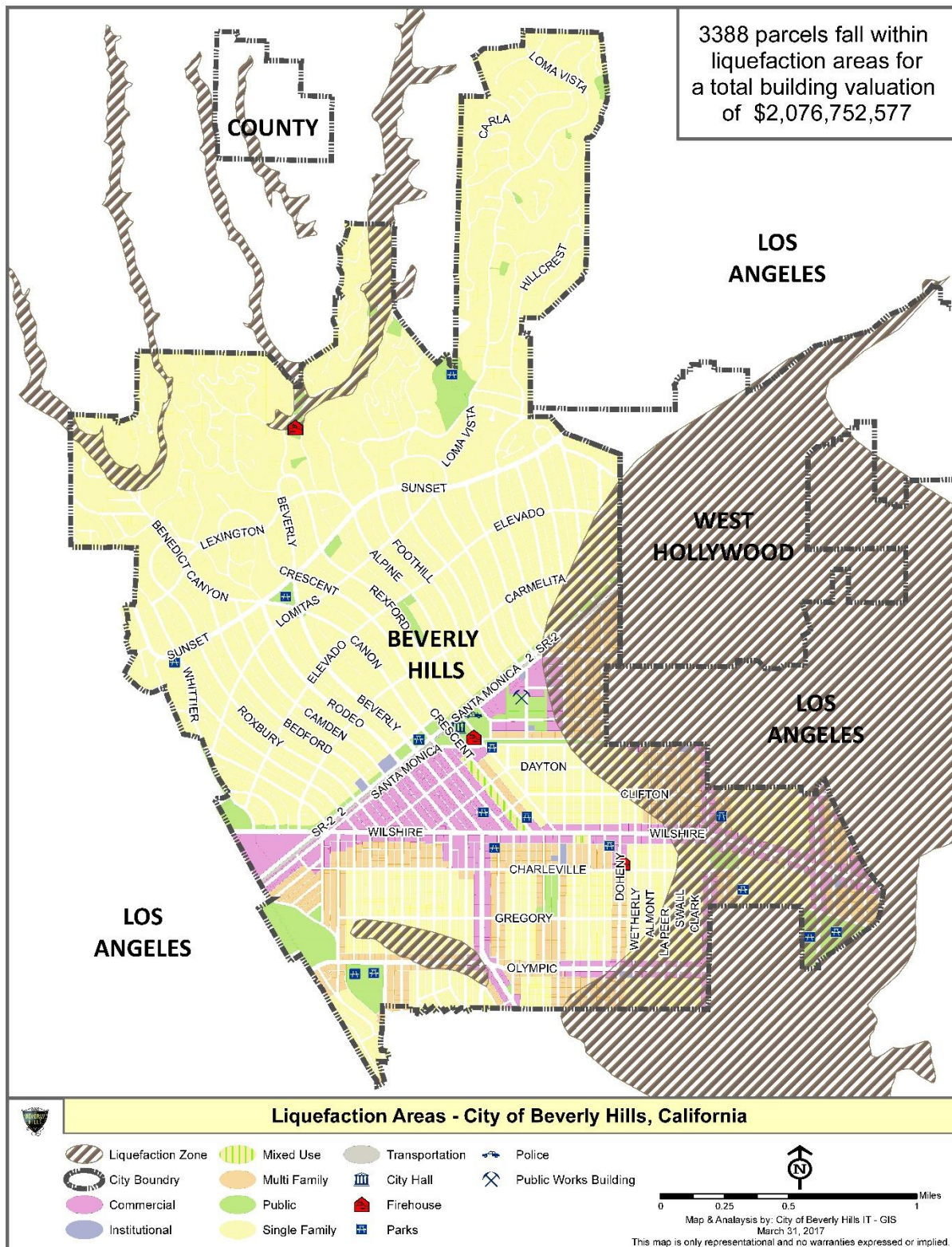
Liquefaction occurs when ground shaking during moderate to severe earthquakes causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no 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 Prieta earthquake. The potential for liquefaction is considered for all new construction in the city. In Beverly Hills, there are about 3,150 parcels with an estimated valuation of \$1.6 billion dollars that are within the Liquefaction Zone – See Map 11 below.

Map 11: City of Beverly Hills 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 (Planning for Natural Hazards: The California Technical Resource Guide, Department of Land Conservation and Development, July 2000). Amplification can also occur in areas with deep sediment filled basins and on ridge tops.

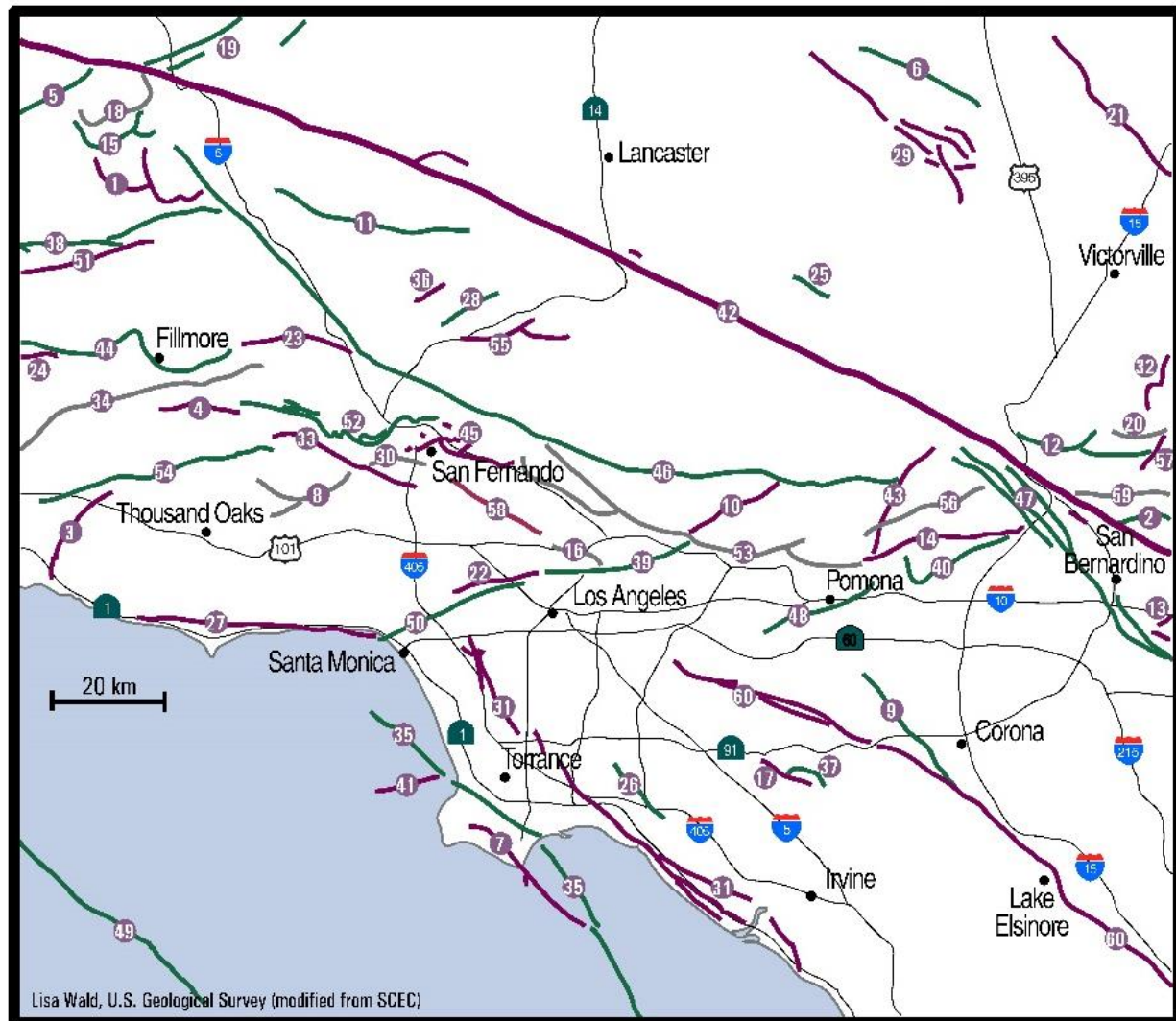
Settlements

Dissipation of seismically induced pore 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. Map 12 depicts the fault zones near and around the City of Beverly Hills.

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, tens 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.

Map 12: Known Earthquake Faults Near the City of Beverly Hills



- | | | | | | |
|----|--------------------------|----|-------------------------------|----|--------------------------------------|
| 1 | Alamo thrust | 21 | Helendale fault | 41 | Redondo Canyon fault |
| 2 | Arrowhead fault | 22 | Hollywood fault | 42 | San Andreas Fault |
| 3 | Bailey fault | 23 | Holser fault | 43 | San Antonio fault |
| 4 | Big Mountain fault | 24 | Lion Canyon fault | 44 | San Cayetano fault |
| 5 | Big Pine fault | 25 | Llano fault | 45 | San Fernando fault zone |
| 6 | Blake Ranch fault | 26 | Los Alamitos fault | 46 | San Gabriel fault zone |
| 7 | Cabrillo fault | 27 | Malibu Coast fault | 47 | San Jacinto fault |
| 8 | Chatsworth fault | 28 | Mint Canyon fault | 48 | San Jose fault |
| 9 | Chino fault | 29 | Mirage Valley fault zone | 49 | Santa Cruz-Santa Catalina Ridge f.z. |
| 10 | Clamshell-Sawpit fault | 30 | Mission Hills fault | 50 | Santa Monica fault |
| 11 | Clearwater fault | 31 | Newport Inglewood fault zone | 51 | Santa Ynez fault |
| 12 | Cleghorn fault | 32 | North Frontal fault zone | 52 | Santa Susana fault zone |
| 13 | Crafton Hills fault zone | 33 | Northridge Hills fault | 53 | Sierra Madre fault zone |
| 14 | Cucamonga fault zone | 34 | Oak Ridge fault | 54 | Simi fault |
| 15 | Dry Creek | 35 | Palos Verdes fault zone | 55 | Soledad Canyon fault |
| 16 | Eagle Rock fault | 36 | Pelona fault | 56 | Stoddard Canyon fault |
| 17 | El Modeno | 37 | Peralta Hills fault | 57 | Tunnel Ridge fault |
| 18 | Frazier Mountain thrust | 38 | Pine Mountain fault | 58 | Verdugo fault |
| 19 | Garlock fault zone | 39 | Raymond fault | 59 | Waterman Canyon fault |
| 20 | Grass Valley fault | 40 | Red Hill (Etiwanda Ave) fault | 60 | Whittier fault |

Source: USGS

Peak Ground Acceleration in Beverly Hills

The peak ground acceleration (PGA) 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 Susceptible 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 on a report prepared by consultant Degenkolb Engineers in 2015 states that 670 buildings including commercial and multifamily buildings were identified as potentially vulnerable to severe damage in the event of severe earthquake activity. Most of the aforementioned buildings were constructed between 1930 and 1980 prior to the 1976 code provisions. Of the 670 buildings, 300 of them are wood-frame soft-story multifamily structures which will mean approximately 1,800 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, and 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 an earthquake to allow for rescue, recovery, and rebuilding efforts and to relay important information to the public.

Disruption of Critical Services

Critical facilities include 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 one 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 (Chamber 101).

Individual Preparedness

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. The City's Office of Emergency Management implements public and employee education on these mitigation actions.

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. In 2005 the city signed with a new commercial contractor which will help to ensure debris removal after a disaster.

Existing Mitigation Activities**Building Study**

In 2015, the City of Beverly Hills completed an analysis of a consultant study on the city's commercial and multifamily building stock and their susceptibility to earthquakes. The City is to use this study to help update the City's Seismic Element of the general plan in 2016, to implement stronger mitigation measures in retrofitting older building stock and to enact several other building and safety measures.

Seismic Modifications for Water System Reservoirs and Pump Stations

In order to be seismically prepared, the City constructed 5 new steel tank reservoirs and pump stations to meet seismic requirements. The final reservoir was constructed and placed into service on June 2015. Currently, all steel tanks and pump stations are in service delivering water to the City.

Operations Service Center Building Mitigation

In order to replace antiquated infrastructure, in 2006 the City demolished the Public Works facilities and merged 4 buildings into one new Public Works Operations Building.

Updated Safety Element of the General Plan

In January 2010, the City updated its Safety Element whose primary purpose of the Safety Element is to reduce the potential risk of death, injuries, property damage, and economic and social dislocation resulting from earthquakes, both urban and wildland fires, terrorism, floods, earthquakes, landslides, public health emergencies, and other natural and man-made disasters. This element specifically addresses fire, flood, geologic and seismic hazards, hazardous materials, noise, and natural and man-made disaster preparedness.

The Great California Shake-out

Every year the City of Beverly Hills participates in the Great California Shake- Out, a state-wide earthquake drill whose mission is to prepare all people and organizations in case of a major earthquake and also to practice how to properly protect individuals when it happens.

Code Development

In California, each earthquake is followed by revisions and improvements in the Building Codes. The 1933 Long Beach earthquake 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. (<http://www.consrv.ca.gov>).

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. The State Department of Conservation operates the Seismic Mapping Program for California. Extensive information is available at their website: <http://gmw.consrv.ca.gov/>.

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.

On January 1, 2017 the City of Beverly Hills adopted the most recent California Building Code. To further improve the resiliency of new construction in Beverly Hills, the City adopted increased requirements for the design and construction of buildings. These structural requirements were developed in correlation with the California Seismic Safety Commission, the International Code Council - L.A. Basin Chapter, local City ordinance, Structural Engineers Association of Southern California, and other industry experts. Additionally, the following is a list of seismic-related amendments in the City of Beverly Hills:

Table 16: Seismic Building Codes

Section	Title
1613.5.2	Structural Separation
1613.5.3	Values for Vertical Combinations
1613.5.4	Wood Diaphragms
1613.5.5	Maximum S_{DS} Value in Determination of C_s and E_v
1613.7	Seismic Design Provisions for Hillside Buildings
1613.8	Suspended ceilings
1704.6	Structural observations
1704.6.1	Structural observations for seismic resistance
1705.3	Concrete construction
1803.2	Investigation required
1807.1.4	Permanent wood foundation systems
1807.1.6	Prescriptive design of concrete and masonry foundation walls
1809.3	Stepped footings

Section	Title
1809.7	Prescriptive footings for light-frame construction
1809.12	Timber footings
1810.3.2.4	Timber
1905.1.7	ACI 318, Section 14.1.4
1905.1.9	ACI 318, Section 18.7.5
1905.1.10	ACI 318, Section 18.10.4
1905.1.11	ACI 318, Section 18.12.6
2304.10.1	Fastener requirements
2304.12.5	Wood used in retaining walls and cribs
2305.4	Quality of Nails
2305.5	Hold-down connectors
2306.2	Wood-frame diaphragms
2306.3	Wood-frame shear walls
2307.2	Wood-frame shear walls
2308.6.5	Alternative bracing
2308.6.8.1	Foundation requirements
2308.6.9	Attachment of sheathing

Source: City of Beverly Hills

- In 1989, in accordance with Senate Bill 547, buildings were surveyed and certain buildings were identified as being unreinforced masonry. With the number of such buildings and the extent 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 contracted 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. The Seismic Element of the plan was updated in 2010.
- In 2015, the City contracted with Degenkolb Engineers to conduct a preliminary field survey of all the commercial and multifamily buildings stock within the City of Beverly Hills in order to develop and implement resilient mitigation policies.

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. Table 17 below provides a sampling of some of the 200 plus laws in the State’s codes.

Table 17: Partial List of California Building Codes

Code Name	Code Description
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 and 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: California Legislative Information

EARTHQUAKE MITIGATION STRATEGIES

For full Earthquake Mitigation Strategies please see Section 4.

This Page Intentionally Left Blank

SECTION 7: WILDFIRE

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why Are Wildfires a Threat to Beverly Hills?	130
History of Fires in Southern California and in Beverly Hills	132
Probability of a Wildfire in Beverly Hills.....	134
Causes and Characteristics of Wildfires in Southern California and Beverly Hills	134
Wildfire Hazard Identification.....	135
Risk Analysis	141
What Is Susceptible to Wildfire.....	141
Existing Mitigation Activities.....	143

Why Are Wildfires a Threat to 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 close to seven thousand reportable fires in California in 2016, with over 550,000 acres burned. According to CDF statistics, in the October 2003 Firestorms, over 4,800 homes were destroyed and 22 lives were lost.

Risk Rating: High

Due to Beverly Hill's proximity to the wildland/urban interface, fire history, the continued appearance of meteorological events that increase wildfire fuel, and potential for severe damage and injury, Beverly Hills is at high risk for wildfires.

Climate Change Impact

Wildfires are impacted by climate change through a variety of factors. Higher temperatures and more frequent and severe drought conditions can produce increased amounts of dead or dry brush, which fuels wildfire activity. Not only can this fuel increase the speed at which a wildfire moves, but large expanses of dry fuel can also increase the size of the burned area. Increased frequency and severity of severe storms may also produce more lightning, which may in turn increase the number of wildfires.

The "fire season," or time during the year when conditions are ideal for wildfires, may also be lengthening. Recent years have shown that snow is melting and vegetation is growing earlier. Therefore, not only is the vegetation available as a fuel source for a longer period of time, but early snowmelt can also exacerbate drought conditions.

Finally, some climate change models have predicted that Santa Ana wind events may increase in intensity, occurrence, and dispersion.

The 2003 and 2007 Southern California Fires

The fall of 2003 marked one of the most destructive wildfire season in California history. In a ten-day period, 12 separate fires raged across Southern California in Los Angeles, Riverside, San Bernardino, San Diego and Ventura counties. The massive "Cedar" fire in San Diego County alone consumed of 2,800 homes and burned over a quarter of a million acres. Table 18 highlights the largest wildfires in California since 2003.

Table 18: Largest California Wildfires Since 2003

County	Fire Name	Date Began	Acres Burned	Homes Lost	Homes Damaged	Lives Lost
Riverside	Pass	10/21/2003	2,397	3	7	0
Los Angeles	Padua	10/21/2003	10,446	59	0	0
San Bernardino	Grand Prix	10/21/2003	69,894	136	71	0
San Diego	Roblar 2	10/21/2003	8,592	0	0	0
Ventura	Piru	10/23/2003	63,991	8	0	0
Los Angeles	Verdale	10/24/2003	8,650	1	0	0
Ventura	Simi	10/25/2003	108,204	300	11	0
San Diego	Cedar	10/25/2003	273,246	2,820	63	14
San Bernardino	Old	10/25/2003	91,281	1,003	7	6
San Diego	Otay / Mine	10/26/2003	46,000	6	11	0
Riverside	Mountain	10/26/2003	10,000	61	0	0
San Diego	Paradise	10/26/2003	56,700	415	15	2
Los Angeles	Station Fire	8/26/2009	160,557	209	57	2
Lassen	Rush Fire	8/12/2012	271,911	0	0	0
Tuolumne	Rim Fire	8/17/2013	257,314	112	7	0
Lassen	Rush Fire	8/12/2012	271,911	0	0	0
Siskiyou	Happy Camp Complex	8/14/2014	134,056	6	2	0
Fresno	Rough	7/31/2015	151,623	4	0	0
Amador	Butte	9/9/2015	70,868	549	44	2
Lake	Valley	9/12/2015	76,067	1958	93	4
Kern	Erskine	6/23/2016	46,684	200	75	2
Monterey	Soberanes	7/22/2016	126,323	57	3	1
San Bernardino	Blue Cut	8/16/2016	37,020	105	3	0
Total Losses			2,353,735	8,012	469	33

Source: Cal Fire (http://cdfdata.fire.ca.gov/incidents/incidents_statsevents#1999)

Additionally, Southern California saw a multitude of fires in 2007. According to CAL Fire, total suppression costs (fiscal year July 2007 - June 2008) were \$524 million, structural damages totaled \$254.1 million, and there were a total of 3,079 structures destroyed in California. In total, over 1,500 homes were destroyed and over 600,000 acres of land burned from Santa Barbara County to the U.S.–Mexico border. An estimated nine people died as a direct result of the fires, and 85 others were injured, including at least 61 firefighters. Table 19 illustrates statistics of the Los Angeles and Ventura County fires.

Table 19: 2007 Los Angeles and Ventura Firestorm Statistics

Fire Name	Date / Time Started	Area Burned	Structures Destroyed*	Injuries/ Deaths
Ranch (Castaic / Piru)	October 20 at 9:42 p.m.	58,401 acres	10	0
Buckweed	October 21 at 12:55 p.m.	38,356 acres	63	4
Canyon	October 21 at 4:50 a.m.	4,565 acres	22	3
Magic	October 22 at 2:17 p.m.	2,824 acres	0	0

Fire Name	Date / Time Started	Area Burned	Structures Destroyed*	Injuries/ Deaths
Meadowridge	October 23 at 12:30 p.m.	40 acres	0	0
Nightsky	October 21 at 10:35 a.m.	35 acres	0	0
October	October 22 at 10:40 p.m.	25 acres	3	0

Source: Cal Fire

*“Structures” is meant to include all loss - homes and outbuildings, etc.

History of Fires in Southern California and in Beverly Hills

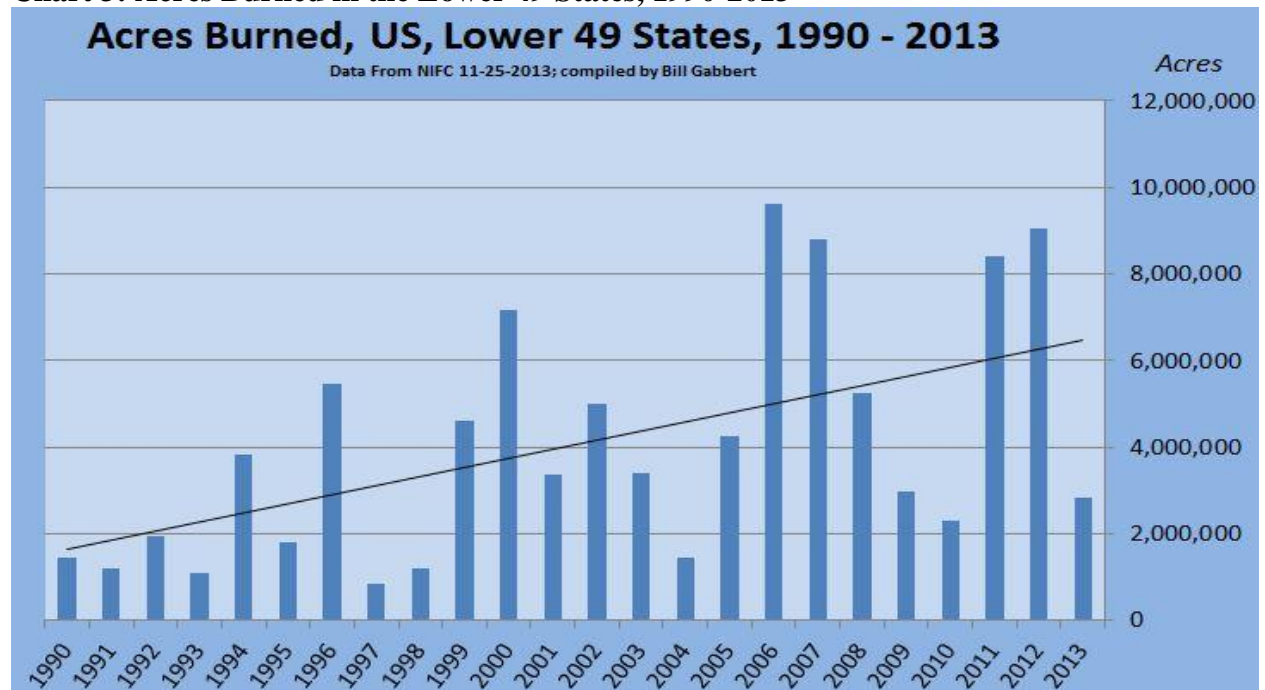
There has not yet been a significant wildland fire of any significance in Beverly Hills, and the last large wildland fire adjacent to the city occurred in Franklin Canyon over 50 years ago. Large fires have always been part of the Southern California landscape. “Written documents reveal that during the 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.” (USGS). Table 20 illustrates the most recent compilation of large historic fires in California.

At 1 pm on April 12, 2007, a blaze ignited in Franklin Canyon, east of the Beverly Glen area of Los Angeles and north of Beverly Hills, where roads meander through neighborhoods of expensive homes. Approximately 200 firefighters fought the blaze. Of those, 25 on-duty and 18 off-duty Beverly Hills Firefighters were assigned to the fire. Mutual aid was provided by the Los Angeles City Fire Department and Los Angeles County Fire Department. The wind-driven wildfire destroyed one home and damaged three other homes in Beverly Hills as dangerous gusts swept dry Southern California. Firefighters attacked the flames from the ground as 5 helicopters repeatedly swooped out of the sky on water-dropping runs that contained the fire to 15 acres, but not before embers ignited expensive homes. Authorities initially said 50 acres had burned, but revised the estimate after surveying the burn area by air. The fire broke out after powerful winds toppled power lines, igniting brush behind a residence.

The Beverly Hills Fire Department maintains an aggressive Brush Inspection Program where over 1,500 homes north of Sunset Blvd. are inspected annually. Property owners are cited if native and landscaped vegetation is not properly groomed between April 1st and August 31st. There was minimal damage to homes in this zone due to continual brush inspection enforcement performed by BHFD personnel in preparation of the fire season.

During 2007-2011, local fire departments responded to an estimated average of 334,200 brush, grass, and forest fires per year. This translates to 915 such fires per day. Taxpayers spent more than \$1.6 billion to combat more than 88,400 fires nationwide (Global Institute of Sustainable Forestry, Yale University). Many of these fires burned in wildland/urban interface areas and exceeded the fire suppression capabilities of those areas. Since 2010, fire suppression costs have averaged over \$1.5 billion dollars for state, private and federal lands (NIFC).

Chart 3: Acres Burned in the Lower 49 States, 1990-2013



Source: Wildfire Today

Table 20: The 20 Largest California Wildfires

	Fire Name (Cause)	Date	County	Acres	Structures	Deaths
1	Cedar (<i>Human Related</i>)	October 2003	San Diego	273,246	2,820	14
2	Rush (<i>Lightning</i>)	August 2012	Lassen	271,911 CA / 43,666 NV	0	0
3	Rim (<i>Human Related</i>)	August 2013	Tuolumne	257,314	112	0
4	Zaca (<i>Human Related</i>)	July 2007	Santa Barbara	240,207	1	0
5	Matilija (<i>Undetermined</i>)	September 1932	Ventura	220,000	0	0
6	Witch (<i>Powerlines</i>)	October 2007	San Diego	197,990	1,650	2
7	Klamath Theater Complex (<i>Lightning</i>)	June 2008	Siskiyou	192,038	0	2
8	Marble Cone (<i>Lightning</i>)	July 1977	Monterey	177,866	0	0
9	Laguna (<i>Powerlines</i>)	September 1970	San Diego	175,425	382	5
10	Basin Complex (<i>Lightning</i>)	June 2008	Monterey	162,818	58	0
11	Day Fire (<i>Human Related</i>)	September 2006	Ventura	162,702	11	0

	Fire Name (Cause)	Date	County	Acres	Structures	Deaths
12	Station Fire (<i>Human Related</i>)	August 2009	Los Angeles	160,557	209	2
13	Rough (<i>Lightning</i>)	July 2015	Fresno	151,623	4	0
14	McNally (<i>Human Related</i>)	July 2002	Tulare	150,696	17	0
15	Stanislaus Complex (<i>Lightning</i>)	August 1987	Tuolumne	145,980	28	1
16	Big Bar Complex (<i>Lightning</i>)	August 1999	Trinity	140,948	0	0
17	Happy Camp Complex (<i>Lightning</i>)	August 2014	Siskiyou	134,056	6	0
18	Soberanes (<i>Illegal Campfire</i>)	July 2016	Monterey	126,323	68	1
19	Campbell Complex (<i>Powerlines</i>)	August 1990	Tehama	125,892	27	0
20	Wheeler (<i>Arson</i>)	July 1985	Ventura	118,000	26	0

Source: http://www.fire.ca.gov/communications/downloads/fact_sheets/20LACRES.pdf

**There is no doubt that there were fires with significant acreage burned in years prior to 1932, but those records are less reliable, and this list is meant to give an overview of the large fires in more recent times.*

***This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.*

Probability of a Wildfire in Beverly Hills

Due to the City's proximity to the wildland/urban interface, there is a high likelihood the City will be impacted by wildfire.

Causes and Characteristics of Wildfires in Southern California and Beverly Hills

There are three categories of interface fire (Planning for Natural Hazards: The Oregon Technical Resource Guide, Department of Land Conservation and Development, July 2000). 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 was the result of three primary factors:

1. Severe drought accompanied by a series of storms that produced thousands of lightning strikes and windy conditions;
2. An infestation of bark beetles that killed thousands of mature trees; and,
3. The effect 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 1,620 parcels fall within this area for a total valuation of \$2.1 billion dollars. See Map 13.

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. In May 2008, the City of Beverly Hills updated its fire code to include a new VHFHSZ map. The code reads as follows:

Section 4704.3 Very High Fire Hazard Severity Zone Map.

The City of Beverly Hills city council hereby designates very high fire hazard severity zones as recommended by the director of the California Department of Forestry and Fire Protection and as designated on a map titled Very High Fire Hazard Severity Zone, May 1, 2008 and retained on file at the Office of the Fire Marshal, 445 North Rexford Drive.

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 km² 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.”

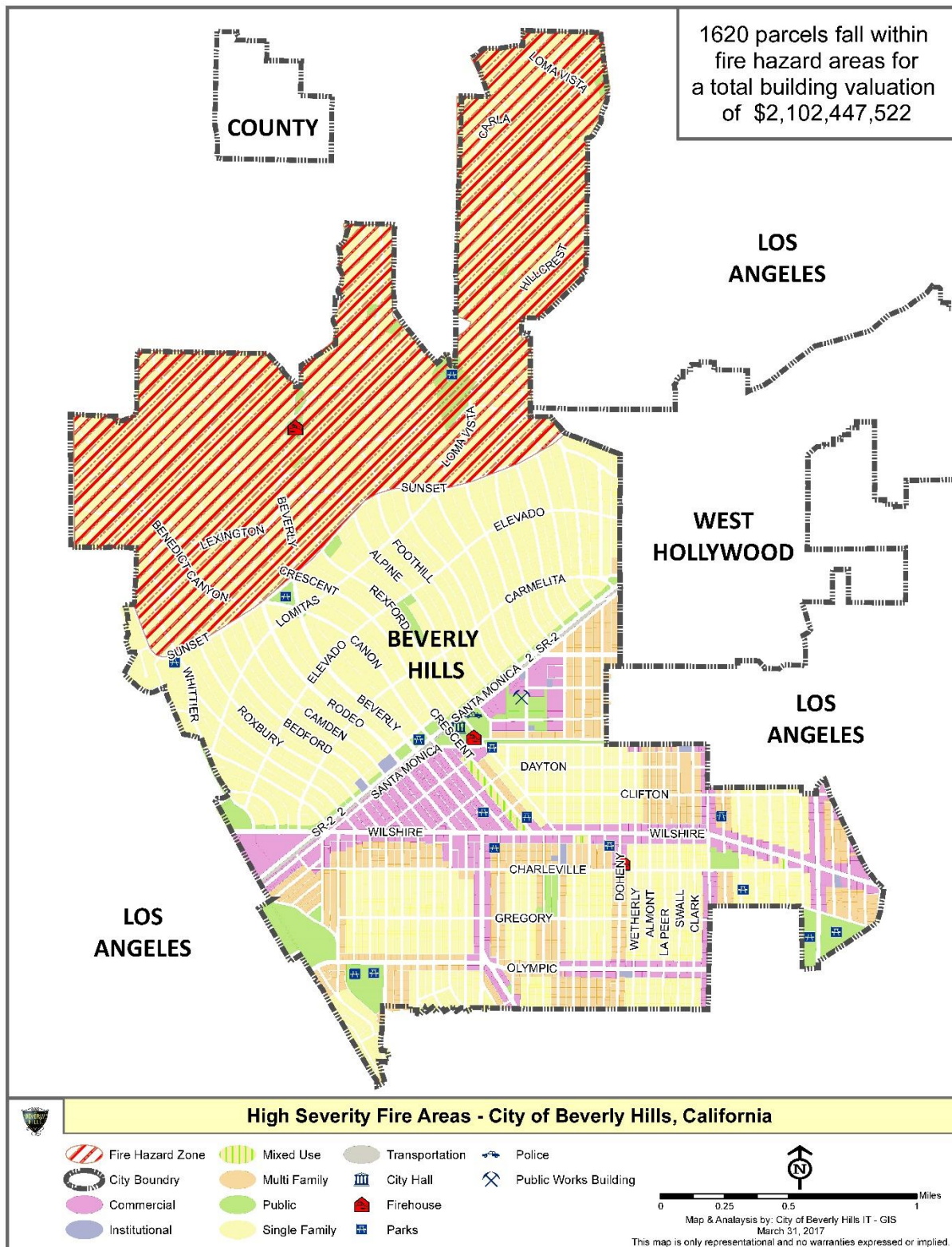
Source: (<http://www.eqe.com/publications/revf93/firefoll.htm>).

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, 169 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 5 very large hotels having occupancies in excess of 500 persons per day, 35 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 quickly a fire can spread.

Map 13: City of Beverly Hills Fire Hazard Zones



Source: City of Beverly Hills

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.

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 Drive, 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.

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 (Planning for Natural Hazards: The Oregon Technical Resource Guide, (July 2000), Department of Land Conservation and Development). 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 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. Rain and snowfall were below normal from 2013 and 2016. According to the US Department of the Interior, California was in one of its driest years on record in 2016 and in January 2014, Governor Jerry Brown declared a drought emergency (<http://www.usbr.gov/mp/drought/>).

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 firefighting 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 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.

Table 21 illustrates a rating system to identify wildfire hazard risk (with a score of 3 equaling the most dangerous and a score of 1 equaling the least dangerous).

Table 21: 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

Source: National Fire Protection Association 1144

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.

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.

Risk Analysis

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 Susceptible 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.

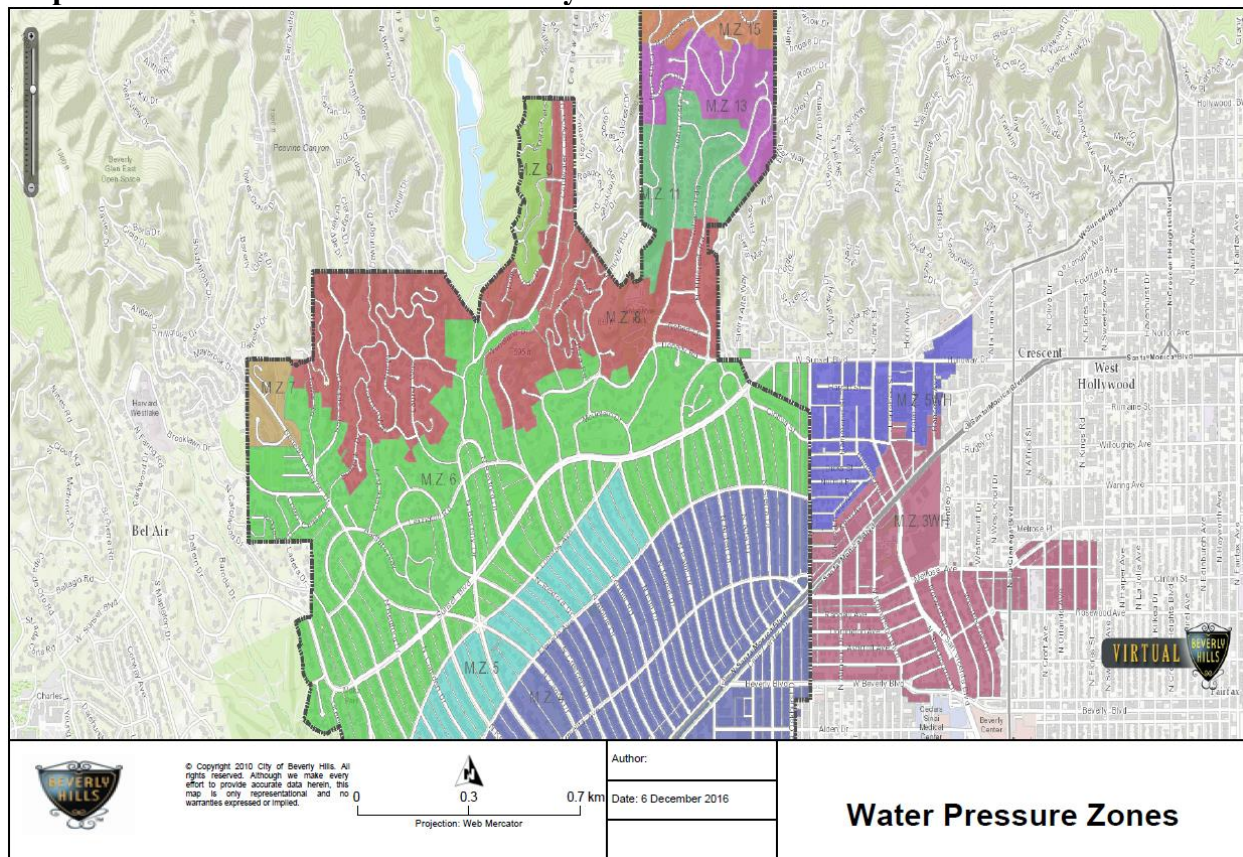
Road Access

Road access is a major issue for all emergency service providers. As development encroaches into the rural areas of the City, 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 have been implemented to improve the flow capacity and reliability to this area. Firefighters 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 firefighting flows. Agreements have been made with the City of Los Angeles to utilize water from their existing grid to augment water pressure within Zone 9. BHFD has contingent plans to supply water to this area in case a catastrophic failure occurs in the water supply pumping system. Zone 9 is diagramed in the Water Dept.'s distribution system.

Map 14: Water Pressure Zones in Beverly Hills



Source: City of Beverly Hills

Existing Mitigation Activities

Wood Roof Ordinance 07-0-2520

In June 2007 the City adopted a new Wood Roof Ordinance, Ordinance 07-0-2520, which requires property owners to have class A roof assembly, no wood products.

Brush Fire Clearance Ordinance 06-0-25-01

In 2006, the City adopted Ordinance 06-0-25-01, strengthening its brush clearance requirements for property owners. Among 13 other brush clearance and maintenance requirements, the ordinance amended the municipal code to require property owners to remove all brush within 200 ft. of their property.

Cost-Recovery Fees

In April 2010, the City's Fire Department increased the property inspection fee for properties located in the City's VHFHSZ. The inspections are crucial to implement and enforce the City's Brush Fire Prevention/Brush Clearance Program.

Firewise Community

In 2005 the City of Beverly Hills was recognized as a *Firewise Community* USA site. The City was honored to be only the 3rd community in California and 114 in the Nation to receive this distinction. The national Firewise Communities program is a multi-agency effort designed to

reach beyond the fire service by involving homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire - before a fire starts. The Firewise Communities approach emphasizes community responsibility for planning in the design of a safe community as well as effective emergency response, and individual responsibility for safer home construction and design, landscaping, and maintenance.

Evacuation Plan

An evacuation plan was developed for the North End of the City of Beverly Hills to address a wildland/urban interface fire. The Evacuation Plan for the North End of Beverly Hills was developed through a collaboration of City of Beverly Hills staff and neighboring cities that border the City of Beverly Hills to develop a comprehensive approach to evacuation. The Plan, quick reference guide, operational guides, canyon maps, and planning form are intended to assist field personnel who are assigned the incident objectives to perform evacuation during emergencies or disasters. This evacuation route could be used for an emergency out of the area.

In addition, as part of its aggressive outreach campaign, the City mails “Operation Evacuation,” a brochure intended to help each and every resident of the City of Beverly Hills, especially those that live in the Santa Monica Mountains in the canyon regions of Beverly Hills, learn how to help themselves save their lives and property in case of a fire hazard.

Public Outreach Campaign

The City of Beverly Hills Fire Department practices a very comprehensive public outreach campaign to ensure all residents are prepared for an urban interface wildfire hazard. The Fire Department sends numerous public education materials to homeowners regarding wildland/urban interface fires, proper vegetation control, emergency evacuation routes, personal fire planning guides, and other materials. Materials are mailed and posted online on the City of Beverly Hills Emergency Management webpage.

Water Tank Capacity Amendment

The City repaired and increased Coldwater Canyon water tank next to Station 2 located adjacent to 1100 Coldwater. The water capacity for the old Coldwater Reservoir was 7.2 million gallons and was upgraded to hold 8.3 million gallons.

Zone 9 (Closed Water Pressure Zone) Hillside Fire Protection

This project is set 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. The project is scheduled to be completed in early 2017.

Weed Abatement Programs

Beverly Hills Fire Department maintains an aggressive annual Brush Clearance Inspection Program. Mailings to residents begin in early March and physical inspections begin in early April. 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 programming in schools

Telephone Notification System

To assist in the notification and early warning of the residents in the high-hazard zone, an automated computer dialing system 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 Fire Department adopts new changes to the California Fire Code every three years. 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. This was changed in July, 2007 to prohibit all wood products. Section 1505.1; 1505.1.1; and 1505.1.1

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 (National Interagency Fire Center, Boise ID and California Division of Forestry, Riverside Fire Lab).

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 and Taskforce

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. The City of Beverly Hills established a Wildland Interface Task Force to implement the Firewise program and to develop additional training needs.

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.

ADDITIONAL MITIGATION PROGRAMS AND ACTIVITIES

Some areas of the country are facing wildland/urban issues collaboratively. These are model programs that include local solutions. Summit County, Colorado, has developed a hazard and risk assessment process that mitigates hazards through zoning requirements. In California, the Los Angeles County Fire Department has retrofitted more than 100 fire engines with fire retardant foam capability and Orange County is evaluating a pilot insurance grading and rating schedule specific to the wildland/urban interface. All are examples successful programs that demonstrate the value of pre-suppression and prevention efforts when combined with property owner support to mitigate hazards within the wildland/urban interface.

Prescribed Burning

The health and condition of a forest will determine the magnitude of wildfire. If fuels - slash, dry or dead vegetation, fallen limbs and branches - are allowed to accumulate over long periods of time without being methodically cleared, fire can move more quickly and destroy everything in its path. The results are more catastrophic than if the fuels are periodically eliminated. Prescribed burning is the most efficient method to get rid of these fuels. In California during 2003, various fire agencies conducted over 200 prescribed fires and burned over 33,000 acres to reduce the wildland fire hazard.

Firewise

Firewise is a program developed within the National Wildland/ Urban Interface Fire Protection Program and it is the primary federal program addressing interface fire. It is administered through the National Wildfire Coordinating Group whose extensive list of participants includes a

wide range of federal agencies. The program is intended to empower planners and decision makers at the local level. Through conferences and information dissemination, Firewise increases support for interface wildfire mitigation by educating professionals and the general public about hazard evaluation and policy implementation techniques. Firewise offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences. The interactive home page allows users to ask fire protection experts questions and to register for new information as it becomes available.

In 2004, the area in the VHFHSZ underwent an assessment by the Firewise Communities USA program. From this assessment, a series of recommendations was considered by a council formed by community members. This committee continues to explore avenues to enact the recommendations and add more, shepherding them through the various processes that are required.

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 on July 7, 2004. Some of the highlighted mitigation strategies that have been identified are as follows:

- Replacement of flammable wood roofs - Currently an ordinance requires that all non-Class A roof coverings be replaced (spray application granted to residents experiencing hardships) (considered by Building & Safety). Ongoing efforts to bring these roofs within compliance will make the community safer with the numbers steadily declining.
- 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 are palm tree beards which are easily ignited by flying fire brands. These trees, whether on public or private property, need to be groomed annually.

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 City of Beverly Hills has adopted these stricter guidelines with its Vegetation/Brush Clearance regulations define Ordinance 06-0-25-01.

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.”

For all Wildfire Mitigation Strategies, please see Section 4.

This Page Intentionally Left Blank

SECTION 8: TERRORISM

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why Is Terrorism a Threat to the City of Beverly Hills?	154
History of Terrorist Events in Beverly Hills	154
Probability of Terrorism in Beverly Hills	155
Terrorism Hazard Identification	156
Risk Analysis	158
What Is Susceptible to Terrorism	159
Existing Mitigation Activities	159

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, radiological, and web-based 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 chemical, biological, radiation, nuclear, and explosion or (CBRNE) is a concern. Recent events make CBRNE 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.

Risk Rating: Medium

Due to Beverly Hill's familiarity around the world and proximity to the Los Angeles major metropolitan area, the City is at risk for a terrorist attack. However, the City has not been subject to an attack in recent years. Therefore, the City is at a medium risk for terrorism.

Climate Change Impact

Terrorism is not impacted by climate change.

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. The City's Office of Emergency Management is responsible for consequence management. The following is a chart of domestic terrorist incidents in California since 2005, as identified by the Federal Bureau of Investigation (FBI).

Table 22: Summary of Terrorist Incidents in California*, 2005 - Present

Date	Location	Incident Type	Perpetrator	Killed	Injured
1/05/05	Auburn, Sutter Creek CA	Attempted Arson and Arson	Earth Liberation Front	0	0
4/13/05	Sammanish, WA*	Arson	Earth Liberation Front	0	0
7/7/05	Los Angeles, CA	Arson	Animal rights extremists suspected	0	0
9/16/05	Los Angeles, CA	Arson	Animal Liberation Front	0	0
11/20/05	Hagerstown, CA	Arson	Earth Liberation Front	0	0
11/29/05	San Diego, CA	Arson	Earth Liberation Front	0	0
8/2/08	Santa Cruz, CA	Several civilians including children wounded in incendiary	Animal rights extremists suspected	0	4
3/7/09	Los Angeles, CA	1 automobile damaged in arson	Animal rights extremists suspected	0	0
11/1/13	Los Angeles, CA (LAX)	Shooting	Domestic Terrorist	1	3
11/4/15	Merced, CA (College)	Stabbings	ISIS Inspired	1	4
12/2/15	San Bernardino, CA	Mass Shooting, IEDs	ISIS Inspired	14	22

Source: "Terrorism 2002-2005", Federal Bureau of Investigation (FBI), 2007, National Counter-Terrorism Center

*Out of state

Probability of Terrorism in Beverly Hills

As a well-known city in the world-renown metropolitan area of Los Angeles, Beverly Hills is at risk for a terrorist attack. The attack may be directly targeting the city or may be targeting other areas in the greater area (such as downtown Los Angeles, the beach areas, the Port of Long Beach, etc.). Sites that are most likely to suffer the impact of terrorism in the City of Beverly Hills may include government facilities, such as City Hall, and entertainment and cultural facilities such as the business triangle, Rodeo Drive, and the more popular hotels.

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 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.”

Also known as citizen grand juries, common law courts are self-elected vigilante organizations that claim for themselves the authority of law. They use these courts to declare themselves outside the jurisdiction of federal and state laws, issue harassing liens against the property of political opponents, and proclaim their right to arrest, judge, and even kill their opponents.

- **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. The City of Beverly Hills Police Department first responders have become familiar with WMD. Officers have undergone training and are aware of 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. Nuclear terrorism threat is on the rise due to recent activity amongst foreign countries and the discussions regarding their nuclear capabilities. Recent revelations have surfaced regarding the ability to purchase uranium. Because of this current climate, the potential for the creation of “Dirty Bombs” or a small nuclear device is a strong possibility.

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.

Risk Analysis

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 list below, the City has identified critical sites and will assess the vulnerability of these sites to a 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.

The following list includes several tasks and roles which identify law enforcement’s 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 Susceptible 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.

Police Officer First Responder Training

The City of Beverly Hills Police Department has completed training of officers which includes training on Weapons of Mass Destruction (WMD). In addition, training for new hires is on-going. All officers are trained and equipped for operational level. Currently the Police Department conducts its own in-house training. The course, “Hazardous Materials, Weapons of Mass Destruction, First Responder Operations, and Law Enforcement Field Support Course” is a 16-hour training and is mandatory for all newly hired officers. The course of instruction covers the first responder’s role for HazMat and WMD (nuclear, biological, chemical, biological, incendiary, and explosive) incidents, types of HazMat and WMD incidents, recognizing HazMat and WMD incidents, hazards of HazMat and WMD incidents, safe response to HazMat and WMD incidents, essential notifications, ICS organization and principles, protective clothing, respiratory protection, and pre-activity and post-activity assessment. Training is also on-going in this area through roll call and scheduled department training sessions as new information and/or response procedures are identified or improved upon.

Risk Assessment/ Critical Infrastructure Vulnerability Study

The Police Department along with the Office of Emergency Management conducted a threat assessment of critical locations in the City. The assessment is complete and ongoing; critical structures were identified.

The City of Beverly Hills Police Department's High Tech Crime Task Force and Special Tactics Unit, in conjunction with the Tactical Assessment and Deployment Office, are continuing to assess and update threat assessments of critical locations in the City. This involves assessing the cyber component along with the physical component of each location.

Specifically, an on-going assessment entails an analysis of the infrastructure components focusing on the cyber component and how that component interfaces with the physical component and vice versa. Also, the Units are analyzing the impacts if one or the other component is attacked or compromised, what would be the cascade affect impacting operations of the infrastructure. All systems are investigated from a segmented as well as integrated perspective and assess the impact of attacks on integrated systems and potential consequences.

The Police Department is fortunate to have a Special Agent from the United States Secret Service assigned to the BHPD operated High Tech Crime Task Force and he, along with a BHPD officer are working in conjunction with our Special Tactics Unit and Tactical Assessment and Deployment Office to assess the vulnerabilities of the following areas:

1. Department of Water
2. City Fiber Network
3. Police Department HQ and Operations facilities
4. Fire Department HQ and Operations facilities
5. Power substation hosted by SCE adjacent to the BHPD main facility.
6. GIS for all key infrastructure components
7. Traffic Management System (Cameras maintained and operated by the city, etc.)

Target Hardening

The City has implemented a thorough upgrade to City facilities to provide the utmost efficiency for and to improve security. The City has installed and monitors a security program which has created a high level of security for all buildings where City business is conducted. The system includes a card key access feature which offers increased control. A Closed Circuit Television (CCTV) program has been initiated.

The Police Department in conjunction with other City Critical Infrastructure stakeholders such as Water and Information Technology is also engaged in a multi-pronged process of these critical infrastructure and key resource (CI/KR) assets which are essential for the City's delivery of services to its citizens and to life and safety assets. As part of this physical and cyber assessments will be conducted by the Police Department in conjunction with other public and private sector partners of multiple CI/KR assets to include:

- Water Facilities
- Power Substations
- Telecommunications Assets
- City Information Technology Assets
- City School District locations

The following are the series of upgrades that were implemented between 2006 and 2009.

- A second exit for the Police Station (from garage to Civic Center Drive) as an alternate means for Police to exit facility was created.
- In 2009, all main entrance doors were upgraded to operate with electronic doors. Additional surveillance cameras and monitors were added to support the night-time lock down operations. Cameras were installed in the Police Department (including the jail), Coldwater Park and Fire Station #2, reservoirs (Walker, Green Acres, Woodland Dr., Sunset Blvd / Rexford Dr.), water pump station, in the business district at Rodeo Dr./Brighton Way intersection, City Hall Tower, and at Hawthorne, Beverly Vista, and Horace Mann schools.
- Surveillance cameras are being monitored at the Police Department through the Watch Commander's desk and Communications/Dispatch Center in addition to Public Works, IT, and City Hall.
- Video recording system was installed to reinforce overall safety of the Police Department.
- A permanent guard station was created for visitor check-in for City Hall entrance.
- Conceptual designs have been prepared to reconfigure the roadway at Rexford Drive and Civic Center to resemble a standard "T" intersection to improve safety for pedestrians accessing the facilities.
- Working with the City's IT Department, the Access control system was replaced at City Hall, Police Facility, IT Facility, and Library.
- Stop sign added, for safety measures, at Rexford Drive and Civic Center junction.

The following are the series of upgrades that are prospectively being developed by the Department for CI/KR and target hardening between 2015 and 2019.

- Working with the City's IT Department to proactively identify, from a cyber perspective, adverse actors, malware, and other cyber anomalies which may be targeting city networks and the SCADA systems which are hosted by various City Infrastructure providers such as the Water Department and other City Departments and networked systems, SCADA, and Industrial Control Systems.
- Engaging in information and intelligence sharing with regard to cyber and physical vulnerabilities and threat mitigation with other local municipalities within the area, and with other Local, State, and Federal partners. This will include cyber intelligence regarding information relevant to securing and hardening of key infrastructure assets within the City.
- Engaging in cyber and physical assessments and tabletop exercises with other local law enforcement State, and Federal entities regarding the City's infrastructure.
- Formulation of cyber incident response plans pertaining to potential attacks directed toward the city's and police department's network and critical infrastructures.
- Working with the City's IT Department and other City Departments to adopt the national cyber security practices such as those enunciated in the National Institute of Standards and Technology (NIST), Framework for Improving Critical Infrastructure Cyber Security, 2014 edition.
- To serve as a partner with other City Departments in crafting cyber policies by which the police department as an actionable entity of the City and other city departmental entities can jointly conduct cyber analysis, effectuate itself in areas of infrastructure and cyber

security and incident management, intelligence dissemination, and collaboratively working with internal entities and external stakeholders related to these areas and missions.

- Work in a centralized and collaborative manner with other municipal, state, regional, and federal entities regarding pre-event and holistic city assessments and mitigation from an IT perspective and the infrastructure assessments of key sites and venues which serve as primary event locations within the city. This will encompass the pre-event planning of cyber and physical security not only of these primary sites by the infrastructure which directly and tangentially supports these events and locations.
- Engage in macro cross-departmental data analytics, policy and information sharing and attainment.
- Engage in cyber incident response planning at both the individual department level and at the cross-department assistance level.
- Creating a cyber incident response protocol from which each department can draw other assets as well as having available to them law enforcement and prosecutorial assistance in the event actions directed toward the departments' networks rise to the level of criminal acts.
- Creating a resource pool of Federal, State, and Local cyber resiliency resources which lend themselves to identifying vulnerabilities, conducting cyber and physical assessments, and crafting cyber and physical mitigation strategies.
- Working with Private sector entities and the City's Emergency Management Department in the spirit of the City's resiliency programs to ensure, from a cyber and cyber/physical infrastructure and key resource perspective, that assets and resources common to each City Department's digital continuity of operations and procedures plans can be identified, obtained, and delivered in a seamless and efficient manner in the event of natural disaster or other human created cyber or digital events.

Emergency Equipment Purchases

The City has invested in a variety of WMD monitoring and response equipment and has purchased Persona Protective Equipment (PPEs) for all first responders.

Cyber-Terrorism Prevention

In 2008 the City conducted critical updates to the server and storage infrastructure. Electrical systems and HVAC in the Data Center were updated for greater reliability and environmental controls. In 2009 the City strengthened network and systems security by updating the firewall system, enhancing network security with system upgrades and enhanced monitoring tools, and updating the storage area network. An upgrade to the Enterprise Storage System and replacement of Library Tape Open system was completed in 2010.

Given the prospective upgrades articulated above and the partnerships, both public and private sector, that the department plans to enhance and create in the next three to four years, it is the intent of the department to further develop an operational capability to accomplish three strategic objectives for the City and its Departments with regard to Cyber-Terrorism Prevention

- Assess and catalogue City CI/KR assets in an on-going effort to identify current and potential vulnerabilities inherent in either physical design or digital and network architecture so as to isolate, remediate, and eliminate those vulnerabilities

- Create for the Department and assist the City and its Departments in creating and implementing cyber incident response protocols, a cyber-security framework for the City which incorporates best practices and standards from public and private sector entities with regard to physical and cyber security infrastructure.
- Create a paradigm for the Department and the City and its Departments from which cyber and physical intelligence, information, and best practices can be shared with other local cities within the region, State, and Federal partners. This prospective paradigm will seek to embrace the tenets of pro-active vulnerability identification and mitigation and post incident response coordination with other city department entities, other municipal entities, and other private sector entities that are essential to the city's network and infrastructure security and operations.

Terrorism Public Awareness – Community Education

Currently the Police Department Crime Prevention Unit through the Neighborhood Watch Program, along with the Office of Emergency Management and Fire Department through its CERT classes are involved in encouraging and educating the public to be vigilant through terrorism awareness programs. 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.

The Department also prospectively seeks to work with other city departments in promoting cyber security and infrastructure awareness training for city employees. This would encourage city employees to be vigilant regarding such items as cyber security awareness and best practices and social media awareness. It would also promote security issues regarding personal computing, use of social media applications, use of personal computers and mobile devices, and use of city computers and mobile devices. Employees will learn how these devices can be used by adverse actors to introduce malware in to personal or city computers and networks as well as obtain personal information about city employees and their families. It also seeks to promote maintaining the integrity of city networks and the data that is contained on those networks.

Cyberterrorism

Impacts

The FBI defines cyberterrorism as the use of computing resources to intimidate or coerce others. There were a number of damaging cyberterrorist attacks in 2014, and Beverly Hills recognizes that the City must take steps to protect itself against these increasingly likely attacks.

Recommendations

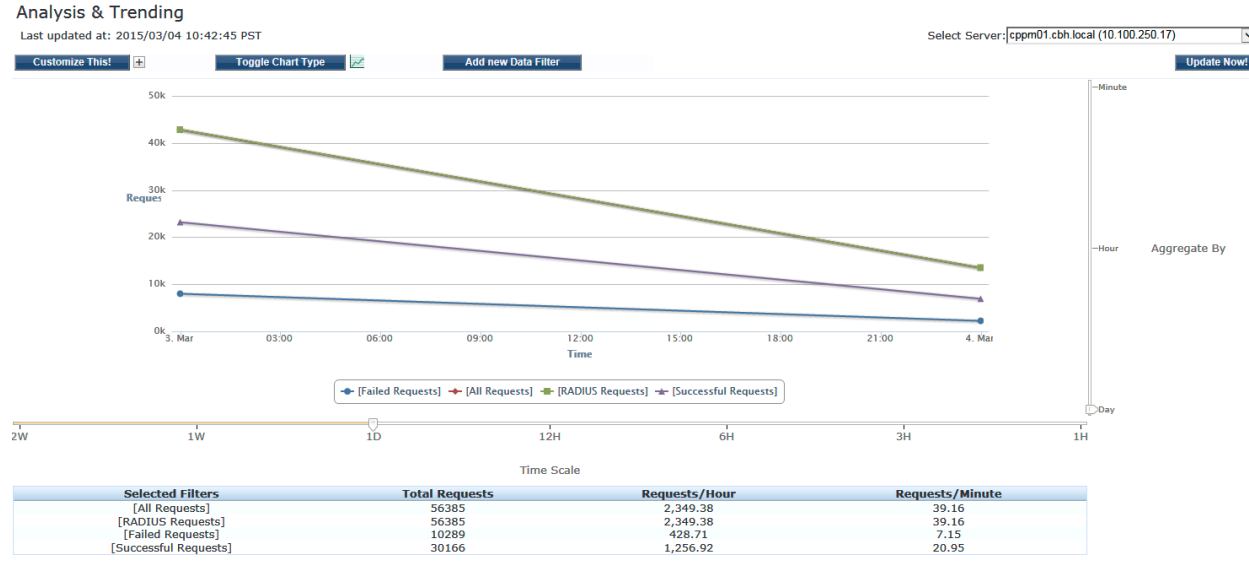
- Implement layers of security, as well as fraud prevention and detection tools.
- Use data analytics to identify security incidents.
- Train users on how to detect and stop social engineering both over the phone and via email. Educating users on the acceptable use best practices is critical.
- Enforce employee compliance with appropriate administrative regulations:
 - 4C.11 – Electronic Mail and Messaging Policy
 - 4C.13 – Voice Mail Policy

- 4C-14 – Information Systems Acceptable Use Police
- 4C.15 – Information Systems Password Police
- 4C-18 Information Systems Virus Protection Policy
- Maintain an inventory authorized and unauthorized devices and software.
- Implement patch application and system software within 48 hours.
- Reduce the number of users with administrative privileges.
- Utilize client certificates to validate and authenticate prior to connecting to the City private network.

The city currently subscribes to several vulnerability intelligence services in order to stay aware of emerging exposures.

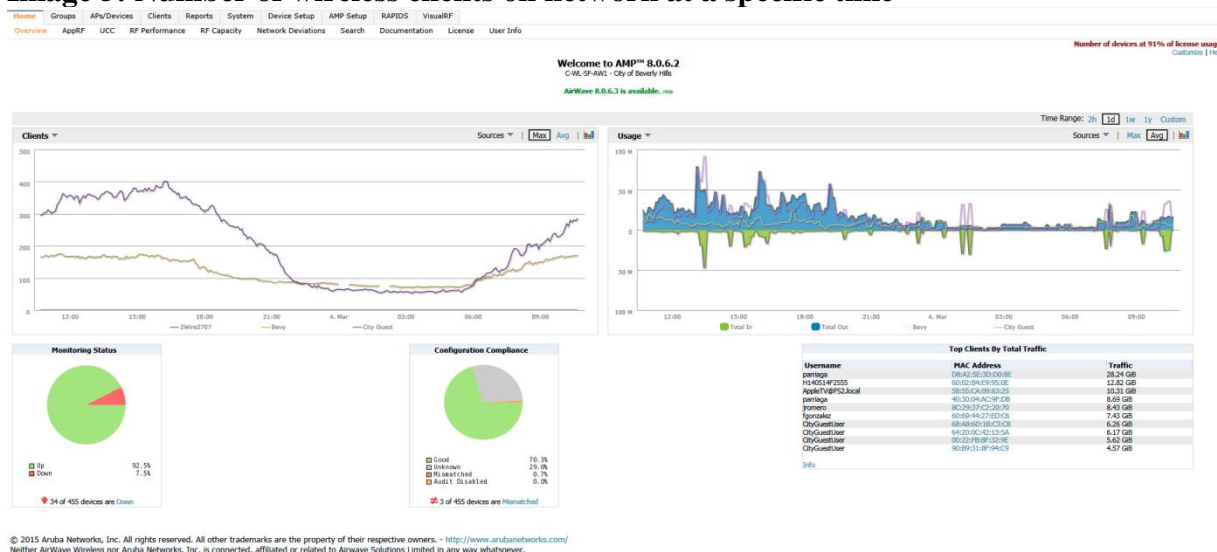
The City also uses wireless intrusion detection systems to identify rogue wireless devices and detect attempts and compromises, and to ensure that AES/WP2 wireless protection is in place.

Image 4: Wireless Network Access Request



Source: Aruba Clear Pass Policy Manager

Image 5: Number of wireless clients on network at a specific time



Source: Aruba Airwave

Intelligence

Created in July 2004, the Police Department's Intelligence Unit is a full time intelligence detail team. Members of the department have received a variety of security clearances including "Top Secret." This Unit monitors local, state, and federal intelligence daily.

Emergency Services Bureau

Created in March 2004, the Police Department's Emergency Services Bureau deals specifically with emergency services and tactical issues.

Explosive Sniffing Canine

In 2003 the City of Beverly Hills purchased a canine specifically trained to sniff out explosive materials. The Police Department is responsible for the training and care of the canine. The canine serves as a great asset to the community by possibly preventing the loss of life and property during a bomb threat emergency.

Cyberterrorism Strategies

The City of Beverly Hills has retrieved over 150 terabytes of data from the Internet in the last year. It has sent into the Internet over 34 terabytes. On average we retrieve approximately 215 gigabytes of Internet traffic daily. Internally, City employees have retrieved over 715 terabytes of data from our data center and uploaded more than 780 terabytes. This represents that approximately 20% of the data moved by City employees was tied to Internet activities while 80% of employee data was served locally.

This massive amount of data movement is conducted across a purpose built network that affords efficiency, performance, redundancy and security. A layer of network telemetry has been created to collect information about the data. The City logs, traces, monitors, scans, generates, and responds to alarms when conditions become abnormal. This is nearly entirely automatic and

dynamic. The City summarizes and analyzes patterns and signature behaviors. Human intervention is only required when something breaks or a user reports a problem.

It takes a collection of hardware and software to establish telemetry and watch over the condition of the network. Some of this equipment is tuned to monitor performance. Some of it provides scrutiny for security purposes. Currently, the City baselines every wired network port for activity. The City knows if something is connected, what type of device it is, how much traffic it sends and receives, and how fast it is. The City monitors the equipment that operates as transport and routing for the data while it is in motion and tries to ensure that multiple pathways are available whenever possible. There is a perimeter around the City's network that affords reasonable security for the users and their devices. The City scrutinizes network traffic as it enters and leaves the network and monitors the pathways into the network to ensure that regulatory compliances are met and threats beyond are minimized.

Beverly Hills uses restrictive access controls on routers and granular policies in firewalls. Intrusion Prevention Systems (IPS) are used to examine every bit of traffic as it enters and leaves the network. The City has tools that can be inserted into the telemetry layer to analyze and monitor activity in real-time for troubleshooting. All of this equipment is based on technology that evolves at a very rapid rate. The speeds and volumes of the network traffic continue to trend higher. Currently, the City is failing behind in its abilities. Some of the City's most insightful tools have exceeded their life expectancy and are no longer working effectively. The City needs to keep pace with the evolution of technology on this front to continue to afford protection to the network. Beverly Hills needs to re-establish the telemetry layer and refresh the tools used for monitoring the health and condition of the network.

The City's workstations and laptops (endpoints) are centrally managed. An inventory of authorized and unauthorized equipment and software is maintained. Secure configurations are developed and distributed using an "imaging" application. There is continuous vulnerability assessment and remediation. A suite of protection products (anti-virus, firewall, intrusion prevention) is installed on each endpoint. The City uses "The Critical Security Controls for Effective Cyber Defense" developed by the Council on Cybersecurity as a guideline to prioritize and focus resources on the most valuable defense actions.

TERRORISM MITIGATION STRATEGIES

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

SECTION 9: FLOOD

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why Are Floods a Threat to the City of Beverly Hills?	168
History of Flooding in Beverly Hills and the Los Angeles Area.....	168
Probability of Floods in Beverly Hills	173
Flood Hazard Identification	173
Flood Risk Analysis	178
What Is Susceptible to Damage during a Flood Event	178
Existing Mitigation Activities.....	180

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 to 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 15 illustrates a map of the City of Beverly Hills with no known flood and/or flooding areas in the City. Since 1993, no major flooding has occurred in the City. In the winter of 2010 Southern California experienced major winter storms with no flooding occurrences in the City. Therefore this threat has greatly decreased by the Holly Hills mitigation storm drain project.

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 the city have had significant long-term effects.

Risk Rating: Medium

Due to Beverly Hill's proximity to mountainous terrain and geographical layout, the City may be impacted by flood events. However, previous events have not had severe consequences and mitigation efforts have been successful in reducing the treat. Therefore, the City is at a medium risk for flooding.

Climate Change Impact

Although increased coastal flooding due to sea level rise is currently more prevalent on the East and Gulf Coasts, there has been some increased flooding along the West Coast. Although Beverly Hills is not expected to be directly impacted by coastal flooding, increased flooding along the nearby coast could indirectly impact the city.

Climate change may also increase the frequency and severity of storms, which may in turn increase localized flooding in the City.

History of Flooding in 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 (July 1, 1949 to June 30, 2016) in the Los Angeles region ranges from 3.21 to 37.96 inches. The region recorded its lowest precipitation of 3.21 inches (July 1, 2006 to

June 30, 2007) and the highest precipitation of 37.96 inches (July 1, 2004 to June 30, 2005). On average, the region experiences 14.23 inches of precipitation during this time range. Historical annual precipitation for the region, including Beverly Hills, demonstrate variations of dry and wet periods from 1949 to 2016. A typical dry period for the region occurs when there's a five year period where the annual precipitation is below the average precipitation level for the region.

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 1949 and 2016.

1. 1952 to 1955: a relatively dry period
2. 1958 to 1961: a dry period
3. 1962 to 1965: a relatively dry period
4. 1965 to 1969: a relatively wet period
5. 1969 to 1972: a relatively dry period
6. 1977 to 1980: a wet period
7. 1986 to 1991: a dry period
8. 1991 to 1995: a wet period
9. 2000 to 2005: a relatively wet period
10. 2006 to 2009: a dry period
11. 2011 to 2016: a dry period

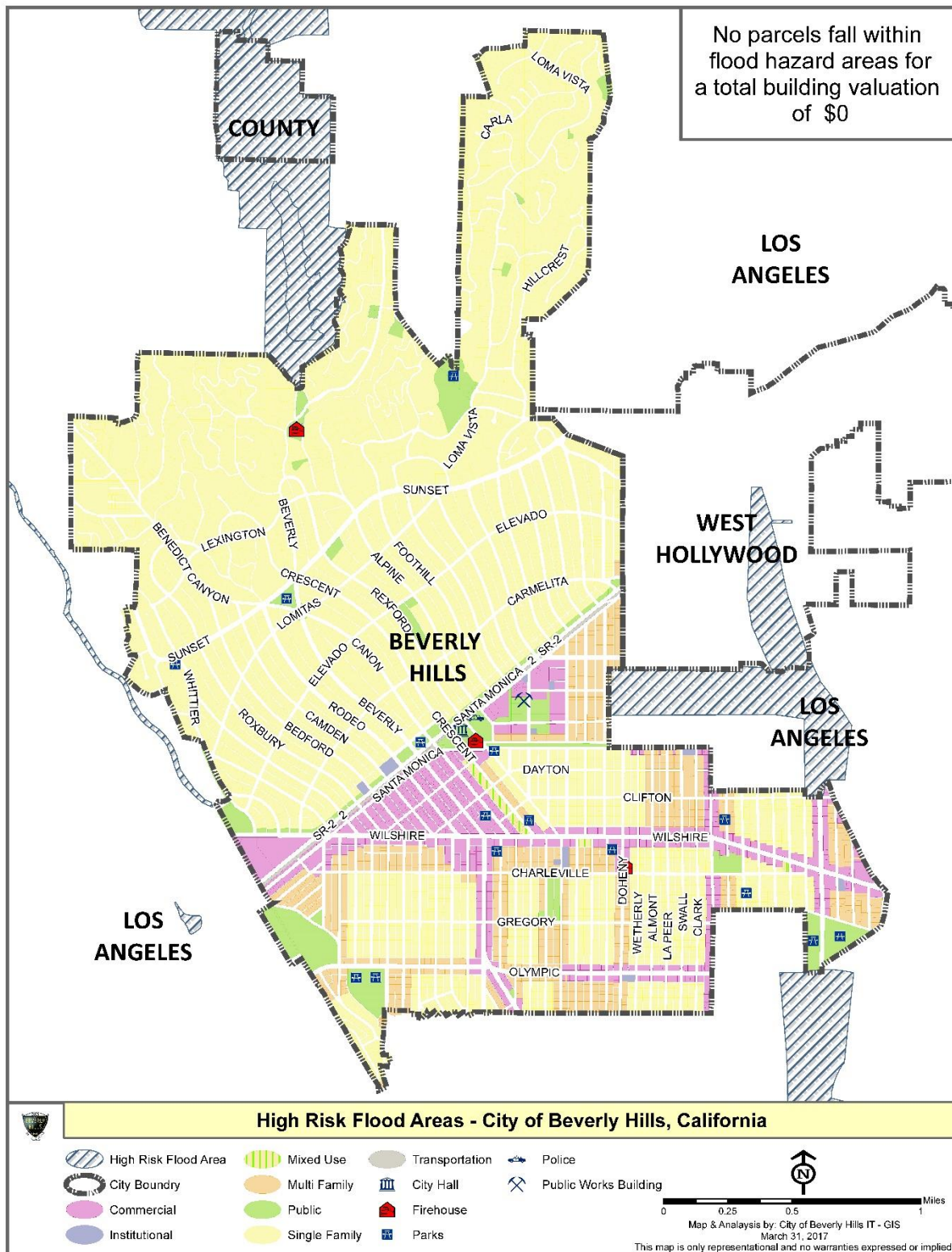
The City of Beverly Hills is part of the coastal plain of Los Angeles County. The majority of the surface area in Beverly Hills is completely urbanized restricting percolation of rain water into the ground. Mountain runoff flows from the base of the Santa Monica Mountains in a south, and southeasterly 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” (Gumprecht, Blake, 1999, Johns Hopkins University Press, Baltimore, MD.)

A typical strong rainfall event in Beverly Hills comes with relatively strong winds that take down tree limbs that ultimately flow down the streets. Tree debris causes catch basin openings to clog and can cause flooding in the City.

Map 15: City of Beverly Hills Flood Areas



Source: City of Beverly Hills

What Factors Create Flood Risk?

Flooding occurs when climate, geology, hydrology and inadequate storm drain capacity combined 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 topography ranging from an elevation of 250 feet to 1,600 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 in 2005 performed an analysis of the Hollyhills Unit 7 drainage system. The analysis recommended increasing the capacity of the drainage system. The Los Angeles County Department of Public Works commenced the Hollyhills Storm Drain Project to increase the system capacity. Upon the completion of the project, the City has not experienced flooding in the area that drains into the Hollyhills Storm Drain System.

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, 1994 -1995 and according to the National Weather Service, Southern California was in an El Nino period through March 2010. As of December 2014, NOAA Climate Prediction Center suggested that Southern California may experience El Nino weather in 2015. Unfortunately, the Los Angeles region did

not experience long heavy rainfall events based on this prediction. The region experienced below average precipitation during this period; and as a result, there were no flooded areas in the City.

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.

As of January 31, 2015, statewide hydrologic conditions were as follows: precipitation, 80% of average to date; runoff, 65% of average to date; and reservoir storage, 65% of average for the date (California Department of Water Resources).

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 from less than 12 inches at the immediate coast to more than 20 inches at the foothills. According to the Los Angeles Almanac, the monthly average rainfall for Los Angeles between July 1, 1949 and June 30, 2016 was 14.23 inches.

On average, 92% 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. Los Angeles 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 1985-1986, 1992, 1993, 1995, 1997, 1998, 2002-2003, 2004 - 05, 2007-2008, and 2010 - 11.

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” (Ibid). 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 consist 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.

Probability of Floods in Beverly Hills

No areas of the City of Beverly Hills fall within a high risk flood area. However, downed tree limbs and other debris can cause localized flooding during heavy rain events. Therefore, the City is at a moderate risk of future flood events.

Flood Hazard Identification

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 paid 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

Based upon the recent FEMA Preliminary Flood Insurance Rate Map panels and Flood Insurance Study report for Los Angeles County, it finds that the City of Beverly Hills is located in a “Zone X” defined as “Area of minimal flood hazard.” The City of Beverly Hills is not considered to be geographically located within a Special Flood Hazard Area (SFHA) within the Ballona Creek Watershed. The Preliminary Flood Insurance Rate Map (FIRM) includes the City of Beverly Hills on the revised preliminary panels, however is outside the area affected. Additionally, the report specifically notes that the area of the City of Beverly Hills is mapped in an area designated “No Special Flood Hazard Areas Identified.” Finally, there are no NFIP insured structures that have been repetitively damaged by floods. As such, the City of Beverly Hills does not participate in the NFIP.

The City of Beverly Hills retained Bryan A. Stirrat and Associates (BAS) to evaluate whether or not there is a continued need for Ordinance No. 96-O-2269 to remain in effect. The ordinance establishes certain restriction and requirements for subterranean construction affecting two areas within the City, which were previously subject to 100-year flooding. Since the ordinance was passed, the Los Angeles County Department of Public Works (LACDPC) commenced construction of the Hollyhills Storm Drain System (HSDS) which was full completed in 2007. Construction of the HSDS has substantially increased the capacity of the overall storm drain system. Several key storm drain reaches and lateral branches have been constructed which now intercept runoff in critical areas of the City and protect the entire region from a 100-year flood, including both areas subject to Ordinance No. 96-O-2269.

Based on the above FEMA Flood Insurance Study Report, including the Bryan A. Stirrat and Associates report, the City may delete Beverly Hills Municipal Code Title 9 – Building and Property Health and Safety Regulations, specifically Chapter 7: Protection of Subterranean Construction From Water Intrusion (Specifically 9-7-1 Applicability, 9-7-2 Residential Construction; Elevation of Floor Levels and Openings, 9-7-3 Nonresidential Construction; Elevation of Floor Levels and Openings, and 9-7-4 Protection of New and Existing mechanical and Electrical System).

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 Capital 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 drains 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.

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 reservoirs. 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. Table 23 below shows significant reservoir failures in Southern California are summarized below.

Table 23: Significant Reservoir Failures in Southern California

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: University of California at Davis, Table of Dam Failures

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. It is inspected by the state annually. Inspection results shows that the reservoir in great condition and not susceptible to failure.

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 ten 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. The City's Public Works Department inspects the remaining reservoirs daily. Part of this inspection consists of identifying any observed infrastructure issues. In order to assure the longevity of the reservoir system, the City replaced all of its above ground reservoirs and constructed a new underground reservoir to meet seismic and current structural requirements. With the continued maintenance and updates on the City's reservoir system, it is unlikely that structural failure or flood water intrusion will occur from non-catastrophic storm events.

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' Emergency Operation Plan.

In addition to the City's reservoir, the Upper and Lower Franklin Canyon Reservoir are located north of and adjacent to the Coldwater Canyon Park Recreational Center on North Beverly Drive. The Upper and Lower Franklin Canyon Reservoirs are 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 2 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 is 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 Landslide.

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.

Flood 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.

Heavy rains in January of 2004 and 2010 resulted in no flooding issues for the City. However, all hazard maps are being updated for this plan and 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 15, no parcels fall within flood areas.

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. Water infusion devices are used in other areas where permanent mitigation is not possible.

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. The City imports approximately 90 percent of its drinking water from Metropolitan Water District of Southern California. The remaining 10 percent is produced locally from four municipal wells and are treated in the City's reverse osmosis water treatment plant.

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 Wastewater Collection Division maintains the storm drain system by cleaning City owned catch basins and area drains. City owned storm drain lines are maintained or replaced within the Capital Improvement Project (CIP) program.

There are also catch basins owned by either Los Angeles County Flood Control District (LACFD) or by the City of Los Angeles (mostly located near the City borders). These catch basins are maintained by their respective owners. If during a rain event and these basins are causing a flood condition, the City's Wastewater Collection staff will attend to these basins to alleviate the flooding conditions. If the City needs to enter or do work in these basins, City staff will acquire the necessary permits from either LACFD or the City of Los Angeles.

Although the City of Beverly Hills has no known flood zones, the City 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 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 completed a massive storm water relief upgrade of the Holly Hills Unit 7 Drainage System in 2005. 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 capital 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 collection system. The wastewater system is maintained by City employees at regularly scheduled intervals. 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 Ballona Creek, which terminates in Marina Del Ray and the Santa Monica Bay.

Stormwater Management

The City of Beverly Hills also owns and operates a storm water collection system. The system is also maintained by City employees at regularly scheduled intervals. Catch basin cleaning are based on year round inspection. The inspection and maintenance workflow system has prevented buildup of leaves and sediments in City owned catch basins. In addition to routine maintenance, the City installed automatic retractable screens (ARS) and will be installing full capture screens to prevent debris from entering the storm drain system. The installation of these two equipment will require an active maintenance program to prevent drainage issues inside the catch basin.

In addition to system maintenance, the City of Beverly Hills follows and enforces stormwater quality regulation through the implementation of the Los Angeles County Municipal Separate Storm Drain System (MS4) NPDES permit. The MS4 NPDES permit is issued by the State Water Resources Control Board which prohibits non-stormwater discharges to the storm drain system and enforces the use of Best Management Practices (BMPs) on all activities to meet water quality standards. The MS4 NPDES permit includes numerical water quality standards where the City's compliance is measured. The City is responsible for creating programs, building green infrastructure and educating stakeholders so that compliance can be attained.

Community Issues Summary

The City of Beverly Hills works to mitigate problems regarding flood issues when they arise. In the past, some areas in the City of Beverly Hills were 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 should no longer be susceptible to flooding conditions and flood related damages.

Reservoirs Assessments

In order to maximize the safety of all citizens, the City replaced 5 above ground steel tank reservoirs to meet seismic conditions. The new steel tanks are equipped with seismic valves which will prevent the flow and reverse flow of water when the steel tank lines have been severely compromised. In addition, the newly built Coldwater Canyon reservoir is also equipped with seismic valves that will prevent a large flow and reverse flow of water after a seismic event.

Water Management

In order to maximize the use of water in the City, the City has expanded their water conservation efforts by installing automatic smart meters to all utility customers. These meters detect continuous flow, tampering and reverse flow from a water customer. Water customers can also be notified if they have a potential leak in their property and make the necessary repairs. In addition, these meters can generate immediate consumption reports at which the water customer can make water use changes to conserve water.

In addition to smart meters, the City has a water main leak detection program. The program's goal is to assess one fifth of the City's 171 mile pipeline each year for leaks.

FLOOD MITIGATION STRATEGIES

Section 4 contains the list of Flood Mitigation Strategies.

This Page Intentionally Left Blank

SECTION 10: LANDSLIDE

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why Are Landslides a Threat to the City of Beverly Hills?	184
History of Landslides in Southern California and Beverly Hills	186
Probability of Landslides in Beverly Hills.....	187
Causes and Characteristics of Landslides in Beverly Hills	187
Landslide Hazard Identification.....	189
Risk Analysis	189
What Is Susceptible to Landslides?	189
Existing Mitigation Activities.....	191

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 (Mileti, Dennis, Disasters by Design: A Reassessment of Natural Hazards in the United States (1999) Joseph Henry Press, Washington D.C.). The best estimate of direct and indirect costs of landslide damage in the United States range between \$1 and \$2 billion annually (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.). 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.” (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/>).

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

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 (Barrows, Alan and Smith, Ted, DMG Note 13, <http://www.consrv.ca.gov/cgs/information>). 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.” (Interagency Hazard Mitigation Team, State Hazard Mitigation Plan (2000) Oregon Emergency Management).

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 presence 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.

Usually, when people think of landslides, they think of avalanches of dirt, mud, and rock pouring down a hillside like an avalanche. While many of the most disastrous landslides happen quickly, triggered by storms, earthquakes, or volcanoes, landslides can also move much more slowly, encouraged downslope by the pull of gravity. In some cases.....the speed of a slow-moving landslide can vary between as much as 3.9 inches/hour to less than 0.4 inches per month.

Risk Rating: Medium

Due to Beverly Hill’s steep terrain and geological makeup, the conditions are right for a landslide. However, historical occurrences have only had a minimal impact on the City. Therefore, the City is at a medium risk for landslides.

Climate Change Impact

Landslides may be impacted by climate change through increased storm severity and increased wildfire activity. A strong storm can cause a landslide after a large amount of rainfall. A recent

wildfire can also exacerbate this situation; the burned landscape and vegetation can no longer hold the soil in place.

History of Landslides in Southern California and Beverly Hills

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 (Robert Olson Associates, Metro Regional Hazard Mitigation and Planning Guide (June 1999). 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 (Ibid). 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 were a few feet deep and 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 loss of property or personal injury was reported.

No significant or major debris flow resulting from landslides 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 Canyon Drive and Benedict Canyon Drive could limit access to residents in those areas.

Probability of Landslides in Beverly Hills

Considering the City's history and risk factors, the City is at a slight risk for landslides.

Causes and Characteristics of Landslides in Beverly Hills

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. 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 affecting landslides include: excavation, drainage and groundwater alterations, and changes in vegetation. (Planning For Natural Hazards: The Oregon Technical Resource Guide, Department of Land Conservation and Development (2000), Ch. 5.).

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.

In April of 2007, the City experienced the "Beverly Fire" which burned 11 acres in Los Angeles and destroyed one home and damaged two homes in Beverly Hills. The natural cover in the area was burned however, the City experienced no debris or mud flows due to this event.

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;
5. Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons; and
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 Community Development Department requires a geotechnical report for grading activities for the hillside developments. The 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 a licensed Soils Engineer/Deputy Inspector and the City 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. (Homeowners Guide for Landslide Control, Hillside Flooding, Debris Flows, Soil Erosion, March 1997).

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. Catch basins are cleaned annually by City Public Works crew. Additionally, to prevent any hazard, during storm events City Public Works crew drive around to make sure catch basins are cleared of debris 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 the native ground cover plants for other ground cover plants may increase the risk of landslide.

Landslide Hazard Identification

Identifying hazardous locations is an essential step towards implementing more informed mitigation activities. The State of California Department of Conservation produces and maintains seismic hazard and landslide maps which are used by the City to determine seismic and landslide risk prior to the issuance of building permits. Development in the hillside areas must comply with the Beverly Hills Building Codes requirements for slope stability (California Department of Conservation, Landslides).

Risk Analysis

Vulnerability assessment for landslides will assist in predicting how different types of property and population groups will be affected by a hazard. (Burby, R. (Ed.) *Cooperating With Nature* (1998) Washington, D.C.: Joseph Henry Press.). 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 Community Development 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 prepared by Community Development Department staff (Map 16) shows the hillside areas north of Sunset Boulevard that exceed the threshold limit (i.e. are steeper than 2:1). An estimated 20% of the land in the City of Beverly Hills exceeds this slope threshold and has potentially unstable soil.

What Is Susceptible to Landslides?

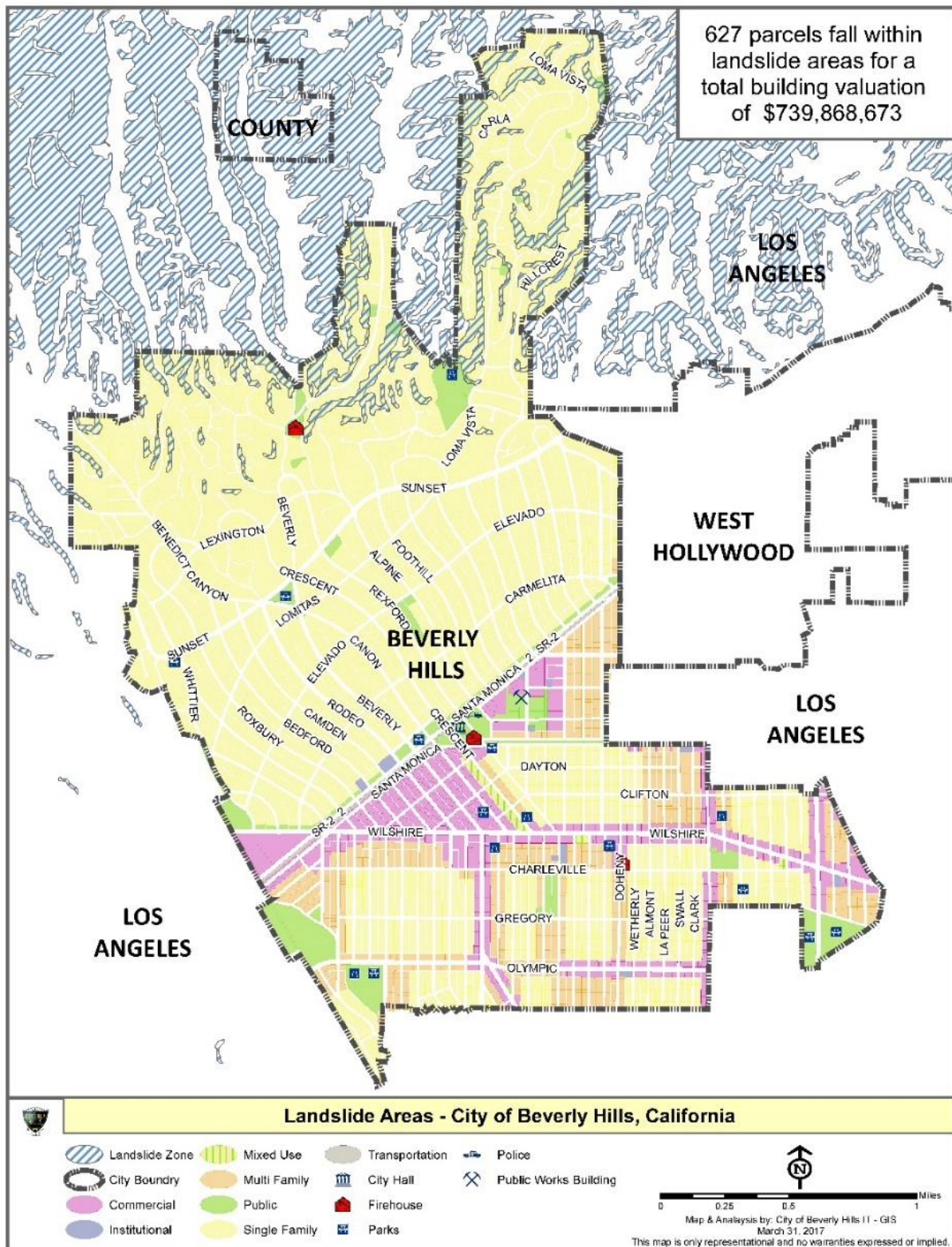
Landslides can affect utility services, transportation systems, and critical lifelines. Communities may suffer immediate damages and loss of service. Disruption of infrastructure, roads, and critical facilities may also have a long-term effect on the economy. Utilities, including potable water, wastewater, 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 Services Department, Street Maintenance Division is responsible for the cleanup of landslides that inhibit the flow of traffic or are damaging the roadway. The Public Works Services 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 owns 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.

Map 16: Slope Instability Potential Map



Source: City of Beverly Hills

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 on 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 the City of Beverly Hills Landslide Building/Zoning Codes. Municipal Code (BHMC) Title 9, which adopted the Amendment of California Building Code (CBC) Chapters 18 and 33, 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. These reports are prepared by a licensed engineer (a consultant retained by the City). City staff review and approve recommendations on reports, and ensure all recommendations are implemented and verified as part of the design plan.

Hillside Development Construction

In 2004, the City has completed the multi-departmental development review process which is in continual improvement at this time. The City continues to take great to encourage applications of designs and construction technologies for steep slopes to reduce the potential adverse impacts from development. The City has adopted amendments to the California Building Code that are specific to hillside construction which include requirements for soils report and design of a foundation system with increased lateral load resistance (1613.7 – Seismic Design Provisions for Hillside Buildings).

Public Outreach of Landslide

The City periodically provides information to educate residents on how to prevent landslides on hillside slopes through public outreach which is coordinated and carried out by the Office of Emergency Management. In addition, the Planning and Development Services Programs of the Community Development Department thoroughly research and analyze building plans in potential landslide areas.

LANDSLIDE MITIGATION STRATEGIES

The landslide mitigation action items (Section 4) provide direction to staff on specific activities that the City 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 (such as City Commissions and the City Council) in pursuing strategies for implementation. Section 4 contains the list of Landslide Mitigation Strategies.

SECTION 11: WINDSTORM

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why Are Windstorms a Threat to the City Beverly Hills?	194
Causes and Characteristics of Windstorms in Beverly Hills	194
Probability of Windstorms in Beverly Hills	196
Windstorm Hazard Identification	196
Risk Analysis	198
What Is Susceptible to Windstorms?	198
Existing Mitigation Activities.....	199

Why Are Windstorms a Threat to the City 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. The City currently has a tree inventory of 24,874 trees. The City of Beverly Hills is known for its lush landscape and its trees are worth millions of dollars.

Risk Rating: Medium

Due to the frequent meteorological conditions that create windy conditions in Southern California, the City is impacted by strong winds frequently (although the mountain range does provide protection). However, typically these windstorms do not cause significant damage to structures, although it may uproot a City tree. They can exacerbate other hazardous conditions, such as wildfire. Therefore, the City is at a medium risk for windstorms.

Climate Change Impact

According to a 2006 study completed by researchers at University of California Berkeley and the Lawrence Berkeley National Laboratory, Santa Ana winds may become more frequent by the end of the century and may shift in time from peaking in September and October to November and December. This could drastically increase the occurrence and severity of severe wind-driven wildfires in California. It may also increase the amount of dry brush available as fuel.

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 University of California Los Angeles internet web site (<http://people.atmos.ucla.edu/fovell/ASother/mm5/SantaAna/winds.html>).

While Santa Ana Wind conditions are indeed a concern for the general Southern California area, 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. The following table illustrates Santa Ana Wind events featured in news resources during 2008-2010.

Table 24: Santa Ana Wind News Stories

August 30th, 2008 LA Times	“September can be too hot to think about fall planting -- or to do much of anything but water. Just remember that even if Santa Ana winds kick up the temperatures, the days are short and the sun is low, new plants can still thrive.”
--	--

January 29th, 2009 OC Register	“Santa Ana winds are gusting across a fairly narrow swath of north-central Orange County, reaching speeds up to 59 mph in Fremont Canyon, above the Anaheim Hills. Nearby areas are getting gusts in the 30s (see below). A high wind advisory is in effect through 2 p.m. Friday, the National Weather Service says.”
March 27th, 2010 Ventura County Star	“Gusty but non-damaging Santa Ana winds Saturday will give way to warm temperatures today, but rain and possibly even snow at unusually low elevations could be on tap Wednesday and Thursday, the National Weather Service said.”
January 13, 2014 USA Today	Red flag warnings for fire danger are posted for much of Southern California as dry and gusty Santa Ana winds blow through the region. The National Weather Service says northeasterly gusts up to 60 mph are possible Monday in the San Gabriel and Santa Monica mountains. A high-wind warning is in effect until noon Wednesday.

Source: Various Newspapers as listed in table

Due to the protection the Santa Monica range offers the City of Beverly Hills from the strong winds that accompany storms moving in from the north, 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 and in isolated areas where strong shear type winds create linear patterns of damage on certain streets or in identifiable directional planes.

There have been four (4) notable wind events in the City from 2010-2016 (See the dates in Table 25). There were a total of 191 wind related incidents with trees, resulting in eight (8) cases of minor to moderate damage to parked vehicles (6) or structures (2). None resulted in significant loss of life or property. The following table illustrates said incidents. Outside of expected impacts to tree budgets, financial impact has been minimal. In addition, the City has not had any claims for damages regarding these events. Table 25 illustrates windstorm incidents that caused damage in the City of Beverly Hills between 2010 and 2016.

Table 25: Windstorm Incident Records for Beverly Hills

Tree Type	Description	Damage	Date
<i>Canary Island Pine</i>	Uproot	Moderate to neighboring landscape/fencing	4/15/2015
<i>Canary Island Pine</i>	Uproot	Heavy to surrounding landscape	3/18/2015
<i>Aleppo Pine</i>	Uproot	Minor to landscape	12/1/2011
<i>Ficus</i>	uproot	None	12/1/2011
<i>Zelkova</i>	uproot	None	12/1/2011
<i>Robinia</i>	uproot	None	12/1/2011
<i>Jacaranda</i>	uproot	Moderate to two automobiles	3/7/2011
<i>Jacaranda</i>	uproot	Minor to street light/building facade	3/8/2011

Source: City of Beverly Hills Public Works, Parks and Urban Forest Manager

*** Note: Address locations have been omitted to ensure privacy*

The City's comprehensive street tree care and maintenance mitigation actions help to limit damages to property and life as a result of a windstorm hazard. The limited number of events and limited levels of damage suggest the City's mitigation efforts have proven effective.

Probability of Windstorms in Beverly Hills

The City is at a high probability of experiencing future windstorm events, although the duration and strength of the windstorms will vary.

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. The following table illustrates the Beaufort scale which is used to categorize wind-related events.

Table 26: Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
9	41-47	Strong Gale	High waves (23-32 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Source: National Oceanic and Atmospheric Administration

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 Table 26) 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 wind throw as wind speeds exceed fifty five (55) MPH. The susceptibility of trees to wind throw 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 to 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.

Risk Analysis

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. Table 25 shows a low frequency of serious problems with the City’s trees. In terms of expenditures for all emergency type tree services, regardless of being wind related or not, continues to be far less than one (1) percent of the City’s annual tree maintenance budget of approximately \$1.4 million.

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. The City also takes steps to protect private property trees and plant materials. The City clears the first 15 feet of City pine trees in the Trousdale and the hillside areas in the interests of ladder fuel concerns.

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 the following:

One for One Declining Tree Removal and Replacement

The removal and replacement of individual trees that are found to be diseased or structurally inadequate is part of the ongoing maintenance of trees in the City.

Street Tree Master Plans

Mass removal and replacement of trees on a City street requires the development of a street tree master plan that includes participation of the residents of the street, mainly in the selection of the street tree. Current Street Tree Master Plan phases include:

Street Tree Master Plan (STMP) Phase One (1)

The removal and replacement of approximately three thousand (3,000) 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 last few remaining trees in this program will be removed and replaced prior to December 31, 2017.

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.

Street Tree Master Plan Phase Three (3)

An ongoing program, Phase Three of the STMP addresses disease and loss problems with Canary Island Date palms ranging in age from sixty (60) to over one hundred (100) years old. All of the City's palms are pruned on an annual basis, making palm related windstorm threats minimal. This phase has an expected timeline of 25-30 years.

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

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.

Public Awareness Campaign

The City periodically distributes information via mail to all residents and community members regarding mitigation and safety practices to prevent the loss of life and property in case of a windstorm hazard event.

EXISTING MITIGATION ACTIVITIES – Interagency Efforts

Tree Pruning and Fire Code Sections

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.

Equipment Testing

In the case of a windstorm event, the City has purchased backup power generators for use during a power failure for Critical City Facilities. Equipment is tested on a regular basis by the Department of Public Works and appropriate records kept.

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.

SECTION 12: DROUGHT

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why is Drought a Threat to the City of Beverly Hills?	204
Probability of Drought in Beverly Hills.....	204
Causes and Characteristics of Drought in Beverly Hills	204
Drought Levels.....	205
Risk Analysis	206
Regional Effects of Climate Change on Water Resources	206

Why is Drought a Threat to the City of Beverly Hills?

Although the City of Beverly Hills does not have extensive farm or agricultural land, drought can still impact the city through a reduction in water availability and water usage restrictions. The City of Beverly Hills receives its water from two sources. The first, the City's Reverse Osmosis Water Treatment Plant, supplies 10% of the City's water. This water is drawn from the City's four groundwater wells within the Hollywood Basin. After being treated, this water is blended with the other 90% of the City's water from the Metropolitan Water District (MWD). The MWD's water source is the Jensen and Weymouth Surface Water Treatment Plant, which draws from the State Water Project and the Colorado River.

As such, when drought impacts the availability of water from any of these sources, the City of Beverly Hills can be impacted by drought. Notably, when the Sierra Nevada mountain range does not receive adequate snowfall during the winter, much of the state will feel the impact the following summer and fall. When the Sierra Nevada snowpack is not completely replenished over multiple years, the drought's severity can decisively increase.

Risk Rating: Medium

Due to meteorological conditions that cause drought in Southern California, Beverly Hills will experience drought conditions in the future. Previous drought conditions have necessitated lifestyle changes (such as decreased use on landscaping), but have not posed a serious life or safety threat. Therefore, the City is at a medium risk for droughts.

Climate Change Impact

As temperatures begin to rise, the snow packs in the mountains will begin to melt earlier in the year. This reduces the amount of water available in Southern California later in the year, causing drought. Additionally, increased wind activity may cause vegetation to dry out more quickly, which may require an increased amount of water to adequately support the vegetation.

Probability of Drought in Beverly Hills

The City is at a medium risk for future drought events.

Causes and Characteristics of Drought in Beverly Hills

A drought is defined as an extended period of time with reduced or no rainfall below normal amounts. When the City of Beverly Hills is impacted by drought, it is in conjunction with a larger geographic area, such as the Los Angeles region, Southern California, the entire State of California, or possibly even the Southwestern United States. A drought can however be defined in several different ways depending on the geographical region and situation:

- Meteorological drought: When the normal level of precipitation has a significant measurable drop.
- Agricultural drought: When the level of soil moisture drops below the suitable range for agricultural growth.
- Hydrological drought: When the surface water and underground water supply falls below normal.
- Socioeconomic drought: When water shortages seriously interferes with human activity.

Drought Levels

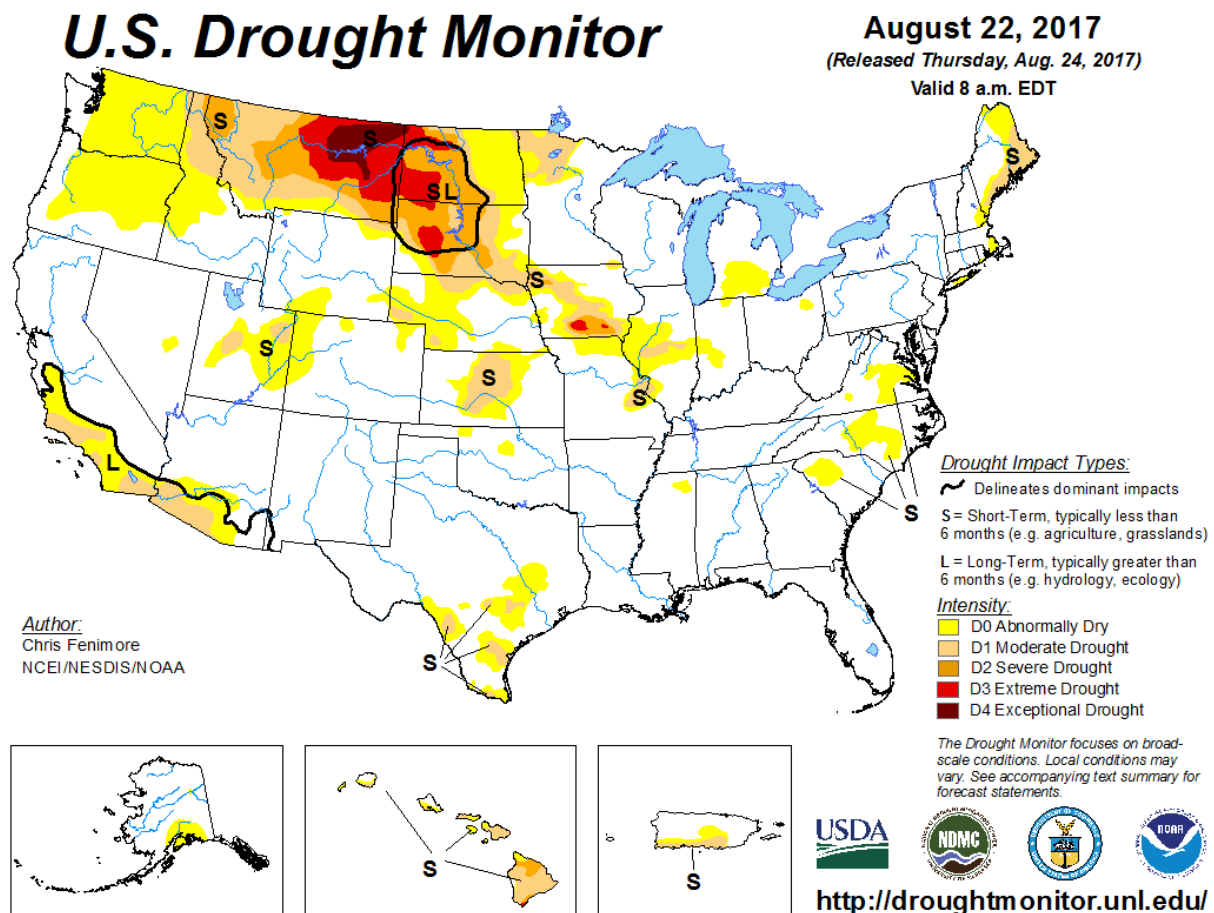
The Palmer Index, developed by Wayne Palmer in the 1960s, uses temperature and rainfall information to formulate dryness. It has become the semi-official drought index. The index is effective in determining long term drought conditions of several months. The index sets normal conditions at 0 with drought conditions in negative values. The index can also be reversed showing the excess of precipitation where the normal conditions at 0 and positive values for amount of rainfall. The advantage of the Palmer Index is that it is standardized to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions.

Table 27: Weekly Palmer Drought and Crop Moisture Data for the Climate Divisions in the Western Region, Week 26 of the 2017 Growing Season

Temp (F)	Precip (In)	Soil Moisture		% Field Cap. End Week	Pot Evap (In)	Run Off (In)	Crop Moist Index	Change from Prev Week	Month Moist Anom (Z) Index	Final Palmer Drought Index	Precip Needed to end Drought (In)
		Upper Layer (In)	Lower Layer (In)								
72.5	0.00	0.00	0.32	4.6	1.04	0.00	-1.62	0.11	-1.39	-3.25 F	2.71

Source: National Weather Service Climate Prediction Center

Map 17: U.S. Drought Monitor, August 22, 2017



Source: United States Drought Monitor

The National Integrated Drought Information System (NIDIS) provides alerts when conditions are favorable for drought. The following table provides information on the different alerts for the National Weather Service:

Table 28: National Integrated Drought Information System Alerts for Droughts

Alert	Criteria	Palmer Drought Index
D0 Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9
D1 Moderate Drought	Some damage to crops, pastures, streams, reservoirs, or wells low, some water shortages developing or imminent, and voluntary water-use restrictions requested.	-2.0 to -2.9
D2 Severe Drought	Crop or pasture losses are likely, water shortages common and water restrictions imposed.	-3.0 to -3.9
D3 Extreme Drought	Major crop and pasture losses with widespread water shortages or restrictions.	-4.0 to -4.9
D4 Exceptional Drought	Exceptional and widespread crop and pasture loss, shortages of water in reservoirs, streams, and wells creating water emergencies.	-5.0 or less

Source: U.S. Drought Monitor Classification Scheme, from the United States Drought Monitor

Risk Analysis

The City, County, and State have experienced several droughts in the past. Most recently, the 2012 to 2016 drought impacted areas across the State and set several records (including driest consecutive years across the state, and record-low precipitation levels). There is a high probability that the City will be impacted by another drought.

Regional Effects of Climate Change on Water Resources

Water Resources

Ninety percent of Beverly Hills's water is imported from State Water Project and from the Colorado River Water System. Unfortunately, climate change has affected these regions. This section will describe the effects of climate change in each region.

State Water Project

According to the California Department of Water Resources, climate change is having a great impact on California's water resources, as evidenced by the changes in snow pack, sea level, river flows and prolonged drought. Likewise, warmer temperatures will cause snow to melt faster and earlier, making it difficult to store and use and have the potential to cause significant flooding in the San Joaquin River Valley Delta. Scientists predict that the risk of a significant flood event will double by 2050 and eight-fold by 2100. Significant flooding of the Delta is predicted to create water quality and supply issues for Central and Southern California. Scientists also predict that by 2050, California's Sierra Mountains will lose about 25% of the snowpack.

Map 18: Sacramento-San Joaquin River Delta

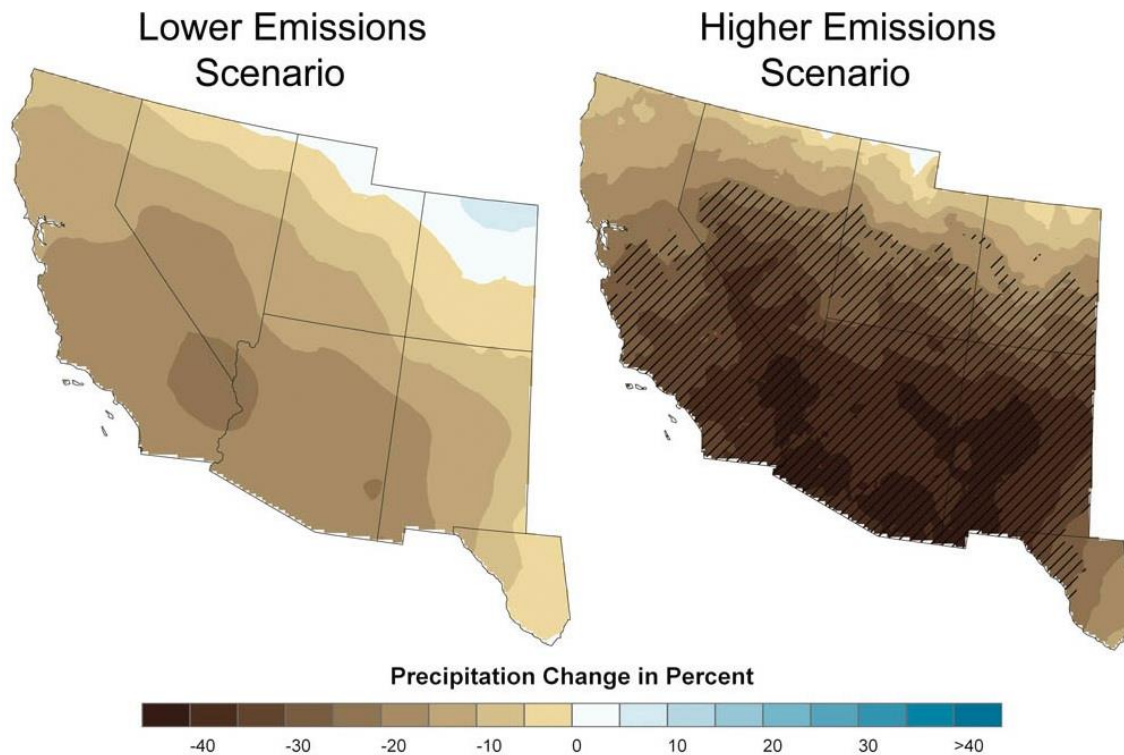


Source: USGS (2010)

Colorado River Basin

Scientists have also predicted significant effects of climate change in the Colorado River Basin. The Colorado River Basin supplies water to seven states starting from Wyoming to California. According to climate change models, the Southwest region will be experiencing increasing temperatures that will reduce snowpack which will lead to reduced stream flows, especially in the spring. Decrease in springtime precipitation will make it more difficult to meet water demands during the summer. This occurrence will stress the groundwater systems to supplement water supply and will have lesser recharge opportunities. With the expected temperature increase, the region is expected to experience more severe drought conditions making the region susceptible for wildfires.

Map 19: Projected Spring Precipitation Change for 2080 – 2099 Compared to 1961-1979 Under Two Emission Scenarios



Note that high confidence in the projected changes is indicated by hatched areas.

Source: USGCRP (2009)

SECTION 13: SPECIAL EVENTS

<i>TABLE OF CONTENTS</i>	<i>PAGE</i>
Why are Special Events a Risk to the City of Beverly Hills?	210
Probability of Special Events in Beverly Hills	210
Special Events Characteristics	210
Hazard Identification	211
Special Event Issues	213
Vulnerability and Risk	215
Special Events Resource Directory	215

Why are Special Events a Risk to the City of Beverly Hills?

As a famous city located in Los Angeles County, Beverly Hills is the site of many public and private events. Surrounded by the city of Los Angeles, Beverly Hills is adjacent to West Hollywood, Santa Monica, and Bel Air, and is home to many influential businesses and residents. Due to Beverly Hills' location and reputation, the City is host to a number of events throughout the year, including the Golden Globes, the Vanity Fair Oscar Party, and the Los Angeles Marathon.

While these events are welcome, they present logistical challenges for the City and requires the use of City resources above and beyond every day needs. Therefore, it was determined that these special events be considered as a "hazard" to facilitate the City's planning response to these occasions.

Risk Rating: Medium

Beverly Hills frequently hosts special events, many on an annual basis. These events may disrupt traffic or cause inconveniences to those in the City. However, most do not pose a life or safety threat. Therefore, the City is at a medium risk for special events.

Climate Change Impact

Special events are not expected to be impacted by climate change.

Probability of Special Events in Beverly Hills

The City is at a high risk for future special events. Many of these events are annual occurrences, and are expected to continue to occur.

Special Events Characteristics

For the purposes of this section, a special event includes, but is not limited to: grand openings, fundraisers, store openings, ribbon-cutting ceremonies, receptions, premieres, fundraisers, festivals, carnivals, run/walks, or a party related to an awards program such as the Golden Globe Awards. A special event can be private or open to the public and held on private and/or public property. Planning a special event typically involves a significant amount of lead-time.

Other major events may include visiting dignitaries, ethnic and religious celebrations, entertainment industry events, and protests or political rallies.

Even without a major incident, large public gatherings cause their own variety of "issues." Crowds in general are associated with increased crime, street closures, and delayed traffic. In many cases, emergency vehicles must detour around special events. If an emergency occurs at the heart of such an event, emergency vehicles may also have trouble getting to the site of the incident. Even without violence or tragedy, the best planned special events are rarely without problems or side-effects.

Beverly Hills can learn lessons from major events in neighboring cities, such as: the July 4th 2000 Pier Shooting; the 2003 Farmers' Market Tragedy; and the 2011 Synagogue Bombing. Other emergencies and tragedies across the nation can also provide learning opportunities, such as: the 1989 earthquake in San Francisco during the World Series; the 1996 bombing at the

Atlanta Olympic Games; the 1999 protests in Seattle during the World Trade Organization meetings; the 2003 fire in Rhode Island during a rock concert; and the 2013 bombing at the Boston Marathon.

Each of these events provides Beverly Hills with a basis for future special event planning.

Hazard Identification

Special events pose three types of hazards:

1. First, such events result in concentrations of large numbers of people within limited geographic areas. Such concentrations exacerbate the effects of any other hazard that may result from, or be coincidental to the event. Special events may increase the likelihood of human caused hazards such as terrorism, civil unrest or high occupancy building fire. Injuries and/or loss of life due to a naturally occurring hazard may be much greater if hazards such as earthquakes or severe weather occur during a special event.
2. Secondly, large scale special events require the deployment of police, fire, and emergency medical personnel, rendering these resources unavailable for response to emergencies in other locations in the City.
3. Finally, many large scale special events result in street closures and increased traffic congestion, slowing response time for emergency personnel and equipment.

Special Event Permits

A special event permit may be required based upon the presence of some of the following elements:

- Temporary change in occupancy load
- Erecting of tent/canopy
- Special lighting
- Generator
- Valet parking
- Street closure/use of public right-of-way
- Presence of press/media/celebrities
- Live entertainment/music
- Presence of animals or any horse-drawn vehicles

Generally, a "special event permit" is not required for events held in hotels with banquet/meeting room facilities or private parties on residential properties, but some permits may still be required (valet permits, tent or building permits, electrical permits for generators, charitable solicitations permit [for fundraising activities], etc.).

Commercial Special Events

Although each event is different, here is a list of permits and/or approvals typically required from different departments:

Table 29: Commercial Special Event Permits

Permit Name	Description	Department
Special event permit	May involve approval from the City Council and ensuring that adequate city	Community Services Department

Permit Name	Description	Department
	resources are available. Depending on the complexity of the project, police, fire and public works personnel may be required to supervise the setup, tear down and the event itself.	
Building or tent permit	If the event involves setting up tents, grandstands, bleachers, stages or other temporary structures.	Fire Department / Building and Safety
Electrical permit	If the temporary structures require wiring, lighting fixtures or a generator.	Building and Safety
Public right-of-way use permit*	If the event will require the use of the sidewalk, curb lane or street right-of-way for the event. A street closure requires approval from City Council and will incur additional fees.	Civil Engineering
Heavy haul permit*	If vehicles that exceed 6000 lbs. gross vehicle weight are used to haul materials or equipment for the event (e.g., truck or crane carrying lifts, power generator, furniture or lighting equipment, etc.)	Civil Engineering
Valet permit	May be required for a single event in a residential or commercial area of the City. The valet company you hire needs to be a company that is authorized to work in the City of Beverly Hills and must obtain the permit directly from the City.	Department of Transportation
Public Assembly Permit	May be required. See document for more details.	Fire Department
Charitable Solicitations Permit	Required for any fundraising event or activity for charitable purpose in the City of Beverly Hills.	Police Department

Source: City of Beverly Hills Filming & Special Events Office

**Please note: To obtain Public right-of-way use or Heavy Haul permits, one must apply in person at the City Hall Permit Center Office, located at 455 North Rexford Dr. Permit applicants (except Moving Van permit in which one needs to apply for it 72 hours in advance prior to actual moving date.) will be required to supply valid insurance certificates indicating general liability coverage of \$1 million (\$2 million for new construction) and auto liability coverage of up to \$2 million. If these permits are issued in conjunction with a filming, still photography or special event permit, the Filming and Special Events office will coordinate with the appropriate permit office; separate applications will be unnecessary.*

Residential Special Event

Although a special event permit is not normally required, some of the permits noted below may be necessary.

Table 30: Residential Special Event Permits

Permit Name	Description	Department
Building or tent permit	If the event involves setting up tents, grandstands, bleachers, stages or other temporary structures.	Fire Department / Building and Safety
Electrical permit	If the temporary structures require wiring, lighting fixtures or a generator.	Building and Safety
Valet permit	May be required for a single event in a residential or commercial area of the City; the valet company needs to be a company that is authorized to work in the City of Beverly Hills and must obtain the permit directly from the City.	Department of Transportation
Charitable Solicitations Permit	Required for any fundraising event or activity for charitable purpose in the City of Beverly Hills.	Police Department
Public Assembly Permit	May be required. See document for more details.	Fire Department
A Neighborhood Block Party Permit	Required for block parties in residential neighborhoods.	Community Services Department

Source: City of Beverly Hills Filming & Special Events Office

Note that there is no permit that allows for extended hours for "activities that create noise." All activities are required to abide by the City's laws and regulations (see Beverly Hills Municipal Code 5-1-104 for General Standards Relative to Disturbance of Peace).

Special Event Issues

Special Event Traffic Management Plans

The Police Department approves permits for special events to determine the appropriate level of response. Responses range from simply posting parking restrictions at the event location to preparation of detailed Special Event Traffic Management Plans for larger scale events.

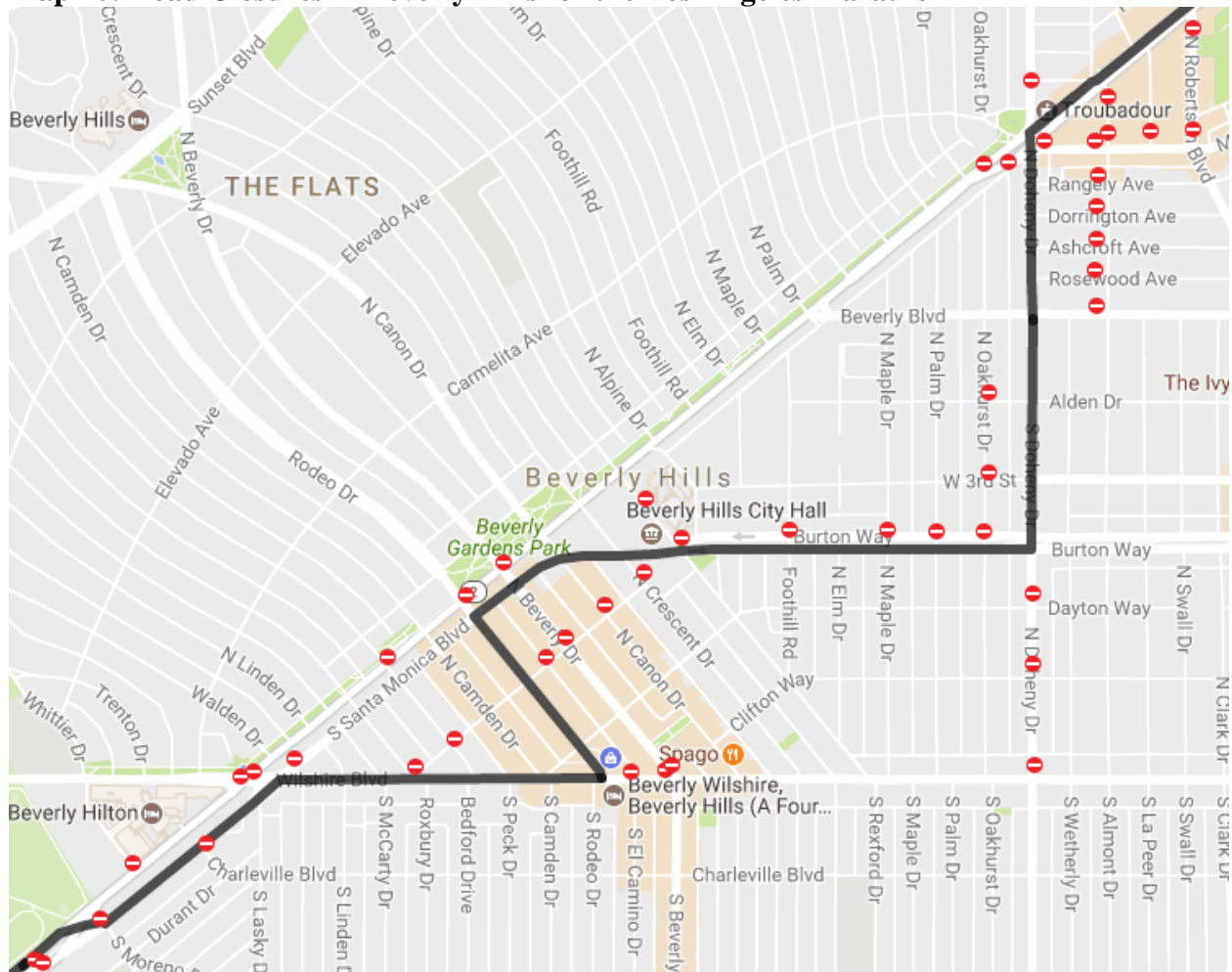
Many factors go into the preparation of a successful Special Event Traffic Management Plan. Discussions are held with event sponsors and other affected agencies to identify issues and areas of concern. Access to critical facilities such as hospitals, churches, and schools must be maintained while minimizing the conflicts between event participants and vehicular traffic.

Conflicts between event participants and non-event traffic are minimized by designing a cordoned area for event participants and designating detour routes around the cordoned area for non-event traffic and transit buses.

The proper preparation and implementation of a Special Event Traffic Management Plan may require involvement from a number of City departments, including field crews, engineering staff and parking enforcement personnel.

As an example of what street closures may impact Beverly Hills, Map 19 illustrates the road closures in the City for the Los Angeles Marathon.

Map 20: Road Closures in Beverly Hills for the Los Angeles Marathon



Source: Los Angeles Marathon Website

Special Event Security

Security for most events can be handled in a routine fashion. However, certain high-profile events require special preparations and planning. For security planning purposes, high profile security events fall into three categories:

1. Unique events that warrant a focus on security simply because they are so rare (such as a visit by the a foreign religious or political leader);
2. Events that would otherwise be considered normal except for the unique nature of the guests or agenda; or
3. Events that are controversial or worthy of media attention.

The assessment of potential threats must take into account a number of factors. First, threats increase for high profile events, especially where media coverage is involved. Participation by VIP's also raises threat levels, as does the symbolic value of the event or venue.

Special event planning is led by the Community Services Department in conjunction with the Police Department (and other City Departments as needed). Since Beverly Hills is host to a large number of special events, the Department maintains standing plans to deal with a wide variety of special events. In addition, the Department maintains single purpose operations plans to deal with specific events or incidents.

For major special events, special operations plans may be prepared specifically for the event. Event planning consists of control and containment. This may be accomplished by the Event Planning Team (consisting of multiple City departments) or a special task force may be created depending upon the size of the event.

Vulnerability and Risk

Beverly Hills will continue to host special events, and will therefore continue to be subject to the potential risks associated with these events. These special events create community among residents in Beverly Hills, celebrate major accomplishments, and promote tourism, but they can also place stress on City departments (especially the Police and Fire Departments), cause inconveniences, and be a target for terrorists.

Appropriate planning is critical to ensure the City is able to continue to host its many special events.

Estimating Potential Loss

Special events in and of themselves pose minimal threats to the physical infrastructure of the City. Critical response facilities, critical infrastructure, and critical operating facilities are unlikely to experience physical damage as a direct result of special events. However, such facilities may be temporarily inaccessible due to special events that involve assemblage of large numbers of people, street closures, or traffic congestion.

Special Events Resource Directory

Filming and Special Events Permit Office
455 N Rexford Dr., First Floor
Beverly Hills, CA 90210

Phone: (310) 285-2408

Fax: (310) 273-0972

This Page Intentionally Left Blank

PART III: RESOURCES

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

Local and 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

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)

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/CYBER TERRORISM

Local and Regional 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

Local and Regional 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 419047

Rancho 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 than 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

NFIP 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 NFIP.

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

Local and Regional Resources

Los Angeles County Department of Public Works

900 S. Fremont 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 NLIC. 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](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

This Page Intentionally Left Blank

APPENDIX B: LOCAL HAZARD MITIGATION ACTION PLAN REVIEW CROSSWALK

Jurisdiction: Beverly Hills, CA	Title of Plan: Local Hazard Mitigation Action Plan	Date of Plan: 2017
Local Point of Contact: Pamela Mottice-Muller	Address: 455 N. Rexford Dr. Beverly Hills, CA 90210	
Title: Director		
Agency: Emergency Management, Resilience, and Recovery		
Phone Number: 310-285-1025	E-Mail: pmottice@beverlyhills.com	

State Reviewer: Lori Newquist	Title: Emergency Services Coordinator	Date: 8/14/2017
Date Received at State Agency	June 8, 2017	
Plan Not Approved		
Plan Approved/Sent to FEMA		

FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region IX		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS				
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	a. Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)?	Plan Update, p 1 Appendix D: Planning and Public Involvement Meetings/Events, p 241	X	
	b. Does the plan list the jurisdiction(s) participating in the plan that are seeking approval?	Plan Update, p 1	X	
	c. Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person's position or title and agency within the jurisdiction.)	THE STEERING COMMITTEE AND PROJECT COORDINATORS 2017-2022, p 22	X	
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	a. Does the plan document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process?	Participants, p 3	X	
	b. Does the plan identify how the stakeholders were invited to participate in the process?	Participants, p 3	X	
A3. Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))		Public/Community Process, p 26 Appendix D: Planning and Public Involvement Meetings/Events, p 241	X	
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		Planning Process, p 22 Hazard Specific Research, p 25	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))		Continued Public Involvement, p 16 & 102	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring,	a. Does the plan identify how, when, and by whom the plan will be monitored (how will implementation be tracked) over time?	Monitor, p 101	X	

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	b. Does the plan identify how, when, and by whom the plan will be evaluated (assessing the effectiveness of the plan at achieving stated purpose and goals) over time?	Evaluate, p 102	X	
	c. Does the plan identify how, when, and by whom the plan will be updated during the 5-year cycle?	Update, p 102	X	
<u>ELEMENT A: REQUIRED REVISIONS</u>				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT (Reviewer: See Section 4 for assistance with Element B)				
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	a. Does the plan include a general description of all natural hazards that can affect each jurisdiction?	RISK ASSESSMENT PROCESS, p 46 The description for each hazard is located in the corresponding section. Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209	X	
	b. Does the plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	OTHER DISASTERS, p 48	X	
	c. Does the plan include a description of the location for all natural hazards that can affect each jurisdiction?	Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209	X	
	d. Does the plan include a description of the extent for all natural hazards that can affect each jurisdiction?	Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209	X	

1. REGULATION CHECKLIST			Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			(section and/or page number)		
B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	a. Does the plan include information on previous occurrences of hazard events for each jurisdiction?	Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209		X	
	b. Does the plan include information on the probability of future hazard events for each jurisdiction?	Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209		X	
B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	a. Is there a description of each hazard’s impacts on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)?	Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209		X	
	b. Is there a description of each identified hazard’s overall vulnerability (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction?	Earthquake – 107 Wildfire – 129 Terrorism – 153 Flood – 167 Landslide – 183 Windstorm – 193 Drought - 203 Special Events – 209		X	
B4. Does the plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		Flood Areas in the City, p 175		X	
ELEMENT B: REQUIRED REVISIONS					
ELEMENT C. MITIGATION STRATEGY					
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	a. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources?	IMPLEMENTATION THROUGH EXISTING PROGRAMS, p 16 & 104		X	
	b. Does the plan document each jurisdiction’s ability to expand on and improve these existing policies and programs?	IMPLEMENTATION THROUGH EXISTING PROGRAMS, p 16 & 104		X	

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))		Flood Areas in the City, 175	X	
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))		GOALS, p 4	X	
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	a. Does the plan identify and analyze a comprehensive range (different alternatives) of specific mitigation actions and projects to reduce the impacts from hazards?	MITIGATION STRATEGY OVERVIEW, p 6 Table 1: 2017-2022 Mitigation Strategies Overview, p 7	X	
	b. Does the plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction?	Table 1: 2017-2022 Mitigation Strategies Overview, p 7 Some mitigation strategies directly apply to a specific hazard while others are multi-hazard in nature.	X	
	c. Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure?	PLAN UPDATE, p 1	X	
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	a. Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)?	Analysis of Mitigation Strategies and Projects, p 97	X	
	b. Does the plan identify the position, office, department, or agency responsible for implementing and administering the action/project, potential funding sources and expected timeframes for completion?	CURRENT HAZARD MITIGATION STRATEGIES, p 70	X	
C6. Does the plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	a. Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated?	Implementation Through Existing Programs, p 16 & p 104 Table 1: 2017-2022 Mitigation Strategies Overview, p 7	X	
	b. Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms?	Implementation Through Existing Programs, p 16 & p 104 Table 1: 2017-2022 Mitigation Strategies Overview, p 7	X	
	c. The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts.	Implementation Through Existing Programs, p 16 & p 104 Table 1: 2017-2022 Mitigation Strategies Overview, p 7	X	

1. REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)		(section and/or page number)		
<u>ELEMENT C: REQUIRED REVISIONS</u>				
<u>ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION</u>				
(Applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	PLAN UPDATE, p 1	X		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Status of Prior Mitigation Strategies, p 68	X		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	PLAN UPDATE, p 1	X		
<u>ELEMENT D: REQUIRED REVISIONS</u>				
<u>ELEMENT E. PLAN ADOPTION</u>				
E1. Does the plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Five-Year Action Plan Matrix, p 1			X
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Not Applicable. This is not a multi-jurisdictional plan.	N/A	N/A	N/A
<u>ELEMENT E: REQUIRED REVISIONS</u>				

APPENDIX C: NATURAL HAZARD RISK ANALYSIS RATING FORM

This form was used in 2004 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 through 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									

**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 than other risks
- Cultural significance of the threat and associated risks
- Opportunity to mitigate for one risk before others due to resource availability
- Distribution of resources

APPENDIX D: PLANNING AND PUBLIC INVOLVEMENT MEETINGS/EVENTS

Public Involvement Events and Meetings for 2017-2022 Update

For previous planning and public meetings, please refer to the City of Beverly Hills Hazard Mitigation Plans for 2004-2009 and 2010-2015.

Homeland Security & Emergency Management Policy Group Meetings 09/2012, 05/2013, 09/2014

Description: Meetings to review Homeland Security and Emergency Management and Homeland strategies status.

Attendees: Mahdi Aluzri, George Chavez, Pamela Mottice-Muller, David Schirmer, Ralph Mundell, Sandra Spagnoli, Erick Lee, Chad Lynn.

Location: Beverly Hills City Hall

Hazard Mitigation Steering Committee Meeting 01/2015, 04/2016

Description: Meeting to discuss progress of HMP and review and approve Mitigation Strategies.

Attendees: Mahdi Aluzri - City Manager, George Chavez - Assistant City Manager, Sandra Spagnoli - Chief of Police, Ralph Mundell – Fire Chief, David Schirmer - Director of Information Technology, Don Rhodes - Chief Financial Officer, Nancy Hunt-Coffey - Director of Community Services, Lolly Enriquez - City Attorney, Susan Healy Keene - Director of Community Development, Pamela Mottice-Muller - Director of Emergency Management

Location – Beverly Hills City Hall

Hazard Mitigation Planning Committee Meeting 01/2015, 03/2015, 05/2016, 10/2016

Description: Mitigation Strategies Development, updating plan and community engagement strategies.

Attendees: City of Beverly Hills HMP Task Force, Pamela Mottice-Muller - Director Emergency Management, A-Reum Han – Consultant, Jesse Deanda – Building and Safety, Ken Pfalzgraf - Public Works, Battalion Chief Scott Stephens – Fire Department, Battalion Chief Joseph Match – Fire Department, Sergeant George DeMarois – Police Department, Raj Patel – Community Development, David Yelton – Community Development, Evelin Welch – Community Development, Timmi Tway – Community Development, Barry Gauthier – City Attorney, Trish Rhay – Public Works, Josette Descalzo – Public Works, Debbie Figoni – Public Works.

Location: City Hall

Multi One-on-One Meetings with Individuals of the Committee 2015-2017

Description: Meetings with individuals to update the Local Hazard Mitigation Action Plan.

Department Head Meetings**01/2016, 03/2016, 06/2016, 01/2017, 03/2017**

Description: Department Head meetings include Directors and heads of departments where agenda items are discussed that are pertinent to the group as a whole.

Attendees: Mahdi Aluzri, George Chavez, Pamela Mottice-Muller, Byron Pope, David Schirmer, Don Rhodes, Laurence Wiener, Nancy Hunt-Coffey, Ralph Mundell, Sandra Spagnoli, Shelley Ovrom, Susan Healy Keene.

Location: Beverly Hills City Hall

Multi Jurisdictional Planning Meeting: Area A**11/2016, 04/2017**

Description: Multi-Jurisdiction Hazard Implementation AREA A Meeting discuss update of hazard mitigation plans.

Attendees: Paul Weinberg – City of Santa Monica, Director of Emergency Services, Lily Campbell – City of West Hollywood Public Safety, Christine Parra – Culver City Emergency Manager, Pamela Mottice-Muller - Director of Emergency Management

Location: Conference Call

Monthly & quarterly meetings**Planning Commission Meeting****04/13/2017**

Description: Commission meeting where plan was presented to Commissioners and their and public input was requested on the renewal of the Local Hazard Mitigation Action Plan.

Attendees: Planning commissioners, Ryan Gohlich – Planning Department, Planning staff, general public.

Location: Beverly Hills City Hall.

Health and Safety Commission Meeting**04/24/2017**

Description: Commission meeting where plan was presented to Commissioners and their and public input was requested on the renewal of the Local Hazard Mitigation Action Plan.

Attendees: Health and Safety commissioners, Pamela Mottice-Muller - Director of Emergency Management, general public.

Location: Beverly Hills City Hall.

Recreation and Parks Commission Meeting**04/25/2017**

Description: Commission meeting where plan was presented to Commissioners and their and public input was requested on the renewal of the Local Hazard Mitigation Action Plan.

Attendees: Recreation and Parks commissioners, Nancy Hunt-Coffey – Recreations and Parks, Recreation and Parks staff, general public.

Location: Beverly Hills City Hall.

Public Works Commission Meeting**05/11/17**

Description: Commission meeting where plan was presented to Commissioners and their and public input was requested on the renewal of the Local Hazard Mitigation Action Plan.

Attendees: Public Works commissioners, Shana Epstein – Public Works, Public Works staff, general public.

Location: Beverly Hills City Hall.

Public Involvement Events

Intro to EERT Classes for City Staff

04/2015, 09/2015, 07/2016, 11/2016, 02/2017

The first class in the series of Employee Emergency Response Team (EERT) training for City of Beverly Hills employees. The HMAP strategies are reviewed and discussed. This training prepares individuals to provide life safety emergency response to a fire, evacuation or other emergencies or disasters in facilities.

Business CERT Classes

11/2015, 11/2016

The City of Beverly Hills Community Emergency Response Training (CERT) is a series of FEMA certified classes designed to teach business how to respond to a disaster situation when emergency services are not immediately available. The HMAP strategies are reviewed and discussed. This training prepares individuals to provide life safety emergency response to a fire, evacuation or other emergencies or disasters in facilities.

Community CERT Classes

02-03/2016, 02/2017

The City of Beverly Hills Community Emergency Response Training (CERT) is a series of FEMA certified classes designed to teach a person how to respond to a disaster situation when emergency services are not immediately available. The HMAP strategies are reviewed and discussed. This training prepares individuals to provide life safety emergency response to a fire, evacuation or other emergencies or disasters in facilities.

Team Beverly Hills Presentation

02/2015, 02/2016, 01/2017

Team Beverly Hills is an educational program developed for residents to inform citizens of their local government representatives, departments and programs. During this presentation, the OEM discussed the Local Hazard Mitigation Action Plan and other emergency processes within the City.

EERT Classes for City Staff

03-11/2016, 09/2017

Employee Emergency Response Team (EERT) training for City of Beverly Hills employees. This training prepares individuals to provide life safety emergency response to a fire, evacuation or other emergencies or disasters in facilities. The series of classes includes Light Search & Rescue, Medical and Disaster Psychology & Team Organization. The HMAP strategies are reviewed and discussed. This training prepares individuals to provide life safety emergency response to a fire, evacuation or other emergencies or disasters in facilities.

Beverly Hills Chamber of Commerce – Government Affairs Committee
03/2017

Presentation of the Local Hazard Mitigation Action plan was made for the Government Affairs Committee at the Beverly Hills Chamber of Commerce. The City of Beverly Hills Emergency Management department also presented information about how to help businesses prepare for a disaster.

Beverly Hills Cable

In the month of May 2017, the local cable channel *Beverly Hills Television Channel 10* aired a notice to the public to provide public input and comments on the Local Hazard Mitigation Action Plan renewal via the various commission meetings and the website.

Website

The public was provided an opportunity to provide input and comments on the plan via the City's Office of Emergency Management webpage. The plan was made public via a link and people were asked to provide comments to the Director of Emergency Management. The following is the link to the Draft Plan:

<http://beverlyhills.org/services/emergency/default.asp>

APPENDIX E: CEQA EXEMPTION/CITY COUNCIL PLAN ADOPTION RESOLUTION

This section will be included following the adoption of the City Council.

This Page Intentionally Left Blank

APPENDIX F: ACKNOWLEDGEMENTS

The Local Hazard Mitigation Action Plan 2017-2022 has been a very comprehensive project that required the efforts, intellect, and patience of numerous staff within the City of Beverly Hills. The scholarly research involved to update hazard sections 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 Local Hazard Mitigation Action Plan is vital in reducing the possibility of the loss of life and property during and after a hazard event. This would not have been possible without the following individuals:

The Steering Committee:

- Mahdi Aluzri
- Susan Healy Keane
- George Chavez
- Ralph Mundell
- Nancy Hunt-Coffey
- Pamela Mottice-Muller
- Sandra Spagnoli
- Lolly Enriquez
- Don Rhoades
- David Schirmer

Project Coordinator Representatives:

Mark Cueno
Vincent Chee
Barry Gauthier
Timothea Tway
Jesse DeAnda
David Yelton
Raj Patel
Evelin Welch
Ken Pfalzgraf
Joseph Matsch
Scott Stephens
Trish Ray
Josette Descalzo
Debbie Figoni
George DeMarois



Creating and maintaining a safer, more sustainable community