CITY OF MANHATTAN BEACH LOCAL HAZARDS MITIGATION PLAN

Draft Date: Friday, October 16, 2015

LETTER OF PROMULGATION

TO: Officials, Employees, and Residents of the City of Manhattan Beach

Preservation of life and property is an inherent responsibility of local, State, and Federal government. The City of Manhattan Beach developed this Local Hazard Mitigation Plan to address actions that can be taken to mitigate the impact of hazards and disasters on the City of Manhattan Beach.

While no plan can guarantee prevention of death and destruction, well-developed plans carried out by knowledgeable and well-trained personnel can minimize losses. The Manhattan Beach Local Hazard Mitigation Plan addresses the major natural and man-made disasters that fall within the scope of responsibility for the City. The Local Hazard Mitigation Plan meets all requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390, Section 322), The Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, April 2013 (Public Law 93-288, as amended, 42 U.S.C. 5121 et. seq., Section 409), and 44 C.F.R, Section 201. The Manhattan Beach City Council gives its full support to the 2016 Hazard Mitigation Plan, and urges all residents, City employees, and community members, individually and collectively, to share in our commitment to responsible preparedness and effective response to disasters.

This letter promulgates the Local Hazard Mitigation Plan, which becomes effective upon approval by the Manhattan Beach City Council.

Signed: _____ Date: _____

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ABBREVIATIONS

CFR	Code of Federal Regulations
City	City of Manhattan Beach
DMA2000	Disaster Mitigation Act of 2000
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
LHMP	Local Hazard Mitigation Plan
NFIP	National Flood Insurance Program
NRC	National Response Center
OES	Governor's Office of Emergency Services
PDM	Pre-Disaster Mitigation
PGA	Peak ground acceleration
HMPT	Hazard Mitigation Planning Team
SFHA	Special Flood Hazard Area
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
State	State of California
UBC	Uniform Building Code
USC	United States Code
USGS	United States Geological Survey

ACKNOWLEDGEMENTS

City of Manhattan Beach Hazard Mitigation Planning Team

Idris Al-Oboudi	Parks & Recreation
Jan Buike	Parks & Recreation
George Butts	Community Emergency Response Team (CERT)
Frank Chiella	Fire Department
Scott Combs	Police Department
Leilani Emnace	Information Systems
Gwen Eng	Finance Department
Scott Hafdell	Fire Department
Andy Harrod	Police Department
Ron McFarland	Building & Safety
Janna Payne	Human Resources
Tatyana Peltekova	Management Services
Jeffrey Robinson	Area G DMAC
Raul Saenz	Public Works
Bonnie Shrewsbury	Geographic Information Systems (GIS)
Liza Tamura	Management Services
Christine Tomikawa	Risk Manager
Ron McFarland	Community Emergency Response Team (CERT)
Tatyana Peltekova	Management Services

Consultant

Crystal Chambers	Constant & Associates
Janna Payne	Constant & Associates
Shannon Marquez	Constant & Associates
Jim Sims	Constant & Associates
Ashley Slight	Constant & Associates
Francisco Soto	Constant & Associates
Robbie Spears	Constant & Associates

Stakeholder Plan Reviewers

Local Resident
Business
Non-Profit

EXECUTIVE SUMMARY

Across the United States, natural and human-made disasters have led to increased levels of injury, property damage, interruption of business and government services, and even death. The impact of disasters on families and individuals can be immense, and damages to businesses can result in economic consequences. The time, money, and effort to respond to and recover from these disasters divert public resources and attention from other important programs and problems.

In 2000, Congress passed the Disaster Mitigation Act (Public Law 106-390) to reinforce the importance of mitigation planning and emphasize planning for disasters before they occur. As such, local communities must have an approved mitigation plan in place prior to receiving both pre-disaster mitigation and post-disaster funds. These plans must demonstrate that proposed mitigation measures are based on a sound planning process that accounts for the risks to and the capabilities of the individual communities.

Applying this knowledge, the City of Manhattan Beach, California has prepared a Local Hazard Mitigation Plan that will guide Manhattan Beach toward greater disaster resistance in full accord with the character and needs of the community and federal requirements. The potential hazards identified and assessed in this version of the Local Hazard Mitigation Plan include: Tsunami, Earthquake; Landslide, and Flood. These hazards may expose the City of Manhattan Beach to the financial and emotional costs of recovering after natural disasters. The inevitability of hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future hazard events. Identifying the risks posed by hazards, and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities.

This Local Hazard Mitigation Plan has been prepared to meet FEMA's requirements of the Disaster Mitigation Act 2000 and the Interim Final Rule, thus making it eligible for funding and technical assistance from State and Federal hazard mitigation programs. Following each major disaster declaration, the City is required to review and update the mitigation strategy. Additionally, in compliance with FEMA regulations, this Local Hazard Mitigation Plan must be reviewed, revised if appropriate, and resubmitted for approval within the next five years so that the City continues to be eligible for various hazard mitigation grant-funding sources.

The 2016 Local Hazards Mitigation Plan (LHMP) is intended to be used by the City in order to assist in outlining projects and setting priorities in order to lessen the impact of natural and man-made incidents on the community members, residents, and businesses in Manhattan Beach. The LHMP includes a community profile, hazards profile, risk assessment, and hazard mitigation strategy to outline the importance of hazard mitigation and ways in which Manhattan Beach can increase resiliency in the face of a variety of hazards.

The LHMP is to be used to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City in creating a more sustainable community.

The LHMP provides a list of activities that may assist City of Manhattan Beach in reducing risk and preventing loss from future hazard events. The action items address multi-hazard issues, as well as activities for Earthquake, Flood, Landslide, and Tsunami

The City of Manhattan Beach is committed to the safety and security of the community, and has developed this LHMP to emphasize that commitment and lessen the impact of disasters on the City.

SECTION 1 OFFICIAL RECORD OF ADOPTION

This section provides an overview of the Disaster Mitigation Act of 2000 (DMA 2000; Public Law 106-390), the adoption of this Local Hazard Mitigation Plan (LHMP) by the local governing body, and supporting documentation for the adoption.

1.1 Disaster Mitigation Act of 2000

The DMA 2000 was passed by Congress to emphasize the need for mitigation planning to reduce vulnerability to natural and human-caused hazards. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act; 42 United States Code [USC] 5121 et seq.) by repealing the act's previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322).

To implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) published an Interim Final Rule in the *Federal Register* on October 21, 2007 (FEMA 2002a). This rule (44 Code of Federal Regulations [CFR] Part 201) established the mitigation planning requirements for states, tribes, and local communities. The planning requirements are described in detail in Section 2 and identified in their appropriate sections throughout the Plan. In addition, a crosswalk documenting compliance with 44 CFR is included as Appendix E.

1.2 Adoption by the Local Governing Body and Supporting Documentation

The requirements for the adoption of an LHMP by the local governing body, as stipulated in the DMA 2000 and its implementing regulations, are described below.

> DMA 2000 REQUIREMENTS: PREREQUISITES
>
> ### Adoption by the Local Governing Body
>
> Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).
>
> *Source: FEMA, October 2011*

The City of Manhattan Beach LHMP meets the requirements of Section 409 of the Stafford Act and Section 322 of the DMA 2000. This includes meeting the requirement that the LHMP be adopted by the City of Manhattan Beach (the City).

This LHMP has been prepared by the City's Hazard Mitigation Planning Team (Planning Team) and adopted by the City Council via resolution, which is presented in Appendix A.

SECTION 2 BACKGROUND

This section provides an overview of the City's LHMP. This includes a review of the background, authority, and purpose of the LHMP and a description of the document.

2.1 Purpose and Authority

The DMA 2000, also referred to as the 2000 Stafford Act amendments, was approved by Congress on October 10, 2000. On October 30, 2000, the President signed the bill into law, creating Public Law 106-390. The purposes of the DMA 2000 are to amend the Stafford Act, establish a national program for pre-disaster mitigation, and streamline administration of disaster relief.

The Manhattan Beach LHMP meets the requirements of the DMA 2000, which calls for all communities to prepare hazard mitigation plans. By preparing this LHMP, the City is eligible to receive Federal mitigation funding after disasters and to apply for mitigation grants before disasters strike. More importantly, this LHMP starts an ongoing process to evaluate the risks different types of hazards pose to the City, and to engage the City and the community in dialogue to identify the steps that are most important in reducing these risks. This constant focus on planning for disasters will make the City, including its residents, property, infrastructure, and the environment, much safer.

The local hazard mitigation planning requirements encourage agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broad public participation enables the development of mitigation actions that are supported by these various stakeholders and reflect the needs of the entire community.

States are required to coordinate with local governments in the formation of hazard mitigation strategies, and the local strategies combined with initiatives at the state level form the basis for the State Mitigation Plan. The information contained in LHMPs helps states to identify technical assistance needs and prioritize project funding. Furthermore, as communities prepare their plans, states can continually improve the level of detail and comprehensiveness of statewide risk assessments.

For FEMA's Pre-Disaster Mitigation (PDM) grant program and Hazard Mitigation Grant Program (HMGP), a local jurisdiction must have an approved LHMP to be eligible for PDM and HMGP funding for Presidentially declared disasters after November 1, 2004. Plans approved at any time after November 1, 2004, will allow communities to be eligible to receive PDM and HMGP project grants.

Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the LHMP. Adoption legitimizes the LHMP and authorizes responsible agencies to execute their responsibilities. Following adoption by the City Council, the plan was reviewed by the Governor's Office of Emergency Services (OES) and approved by FEMA. The resolution adopting this LHMP is included in Appendix A.

2.2 Plan Description

The remainder of this LHMP consists of the following sections.

Community Description

Community Description provides a general history and background of the community and historical trends for population, demographic and economic conditions that have shaped the area. Trends in land use and development are also discussed.

Planning Process

The Planning Process Section identifies Planning Team members, Consultant (and the key stakeholders within the

community and surrounding region). In addition, this section documents public outreach activities and the review and incorporation of relevant plans, reports, and other appropriate information.

Risk Assessment
The Risk Assessment section describes the process through which the Planning Team identified and compiled relevant data on all potential natural hazards that threaten the City and the immediately surrounding area. Information collected includes historical data on natural hazard events that have occurred in and around the City and how these events impacted residents and their property.

The descriptions of natural hazards that could affect the City are based on historical occurrences and best available data from agencies such as FEMA, the U.S. Geological Survey (USGS), the California Geologic Survey, and the National Weather Service. Detailed hazard profiles include information on the frequency, magnitude, location, and impact of each hazard as well as probabilities for future hazard events. Figures (attached as Appendix B) are included to identify known hazard areas and locations of previous hazard occurrences.

Section 5 identifies potentially vulnerable assets such as people, housing units, critical facilities, infrastructure, and commercial facilities. These data were compiled by assessing the potential impacts from each hazard using GIS. The resulting information identifies the full range of hazards that the City could face and potential social impacts, damages, and economic losses.

Capability Assessment
Although not required by the DMA 2000, Section 6 provides an overview of the City's resources in the following areas for addressing hazard mitigation activities:

- Legal and regulatory: Existing ordinances, plans and codes that affect the physical or built environment in a community
- Administrative and technical: The staff, personnel, and department resources available to expedite the actions identified in the mitigation strategy
- Fiscal: The financial resources to implement the mitigation strategy

Mitigation Strategy
As the Mitigation Strategy section describes, the Planning Team developed a list of mitigation goals, objectives, and actions based upon the findings of the risk assessment and the capability assessment. Based upon these goals and objectives, the Planning Team, supported by the Consultant, reviewed and prioritized a comprehensive range of appropriate mitigation actions to address the risks facing the community. Such measures include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

Plan Maintenance
The Plan Maintenance section describes the Planning Team's formal plan maintenance process to ensure that the LHMP remains an active and applicable document. The process includes monitoring, evaluating, and updating the LHMP; implementation through existing planning mechanisms; and continued public involvement.

References
Reference materials used to prepare this LHMP are found in Section 9

Appendices
The appendices include the Adoption Resolution, maps and figures, Planning Team meetings and minutes, public involvement process, 2008 Action Plan Matrix, 2008 Plan results, Capability analysis, Community Tsunami Plan, and a crosswalk for compliance with the DMA 2000.

This section describes the history, location, and geography of the City as well as its government, demographic information, and current land use and development trends.

3.1 History, Location, and Geography

The City of Manhattan Beach is a small but bustling beach town along the Pacific coast with a population of 35,881 residents, per the 2014 Census. Located in southwestern Los Angeles County, and encompassing 3.88 square miles, City elevations range from sea level to 245 feet above sea level. The City includes hills and flat areas, and is nestled between the Pacific Ocean, Hermosa Beach, Redondo Beach, and El Segundo. Figure 3-1 shows the general location of the city within the state of California and the County of Los Angeles; Figure 3-2 shows the general boundaries of the City of Manhattan Beach.

In 1863, a Scottish immigrant, Sir Robert Burnett, purchased Rancho Sausal Redondo and Rancho Aguaje de la Centinela from Avila's heirs for $33,000. Ten years later in 1873, Burnett leased the ranch to a Canadian, Daniel Freeman. Burnett returned to Scotland. Freeman moved his wife and three children onto the ranch and started growing various crops. On May 4, 1885 Freeman bought the ranch from Burnett for $140,000.

George H. Peck owned a lot of the land that became part of the north section of Manhattan Beach. A coin flip decided the town's name. Around 1902, the beach suburb was named "Manhattan" after developer Stewart Merrill's home, the New York City borough of Manhattan. "Beach" was appended to the city's name in 1927 at the behest of the postmaster. (Source: Grenier, Judson, Capsule History of Manhattan Beach, 1912 – 1975).

The land in Manhattan Beach was formerly sand dunes. During the 1920s and 1930s, builders leveled uneven sandy sites and some excess sand was sold and shipped to Waikiki, Hawaii, to convert their reef and rock beach into a sandy beach. The sand was also used to build the Los Angeles Coliseum and portions of the Pacific Coast Highway.

Temperatures in the City of Manhattan Beach vary from around 49 degrees in the winter months to 75 degrees in the summer months. However the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures, very low humidity, and strong winds. (Source: CityTownInfo.com)

Rainfall in the region averages 13.1 inches per year. But the term "average" means very little in Los Angeles County 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. (Los Angeles County)

Furthermore, actual rainfall in the Southern California region tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. As the metropolitan basin is largely built out, water originating in higher elevation communities can have a sudden impact on adjoining communities that have a lower elevation.

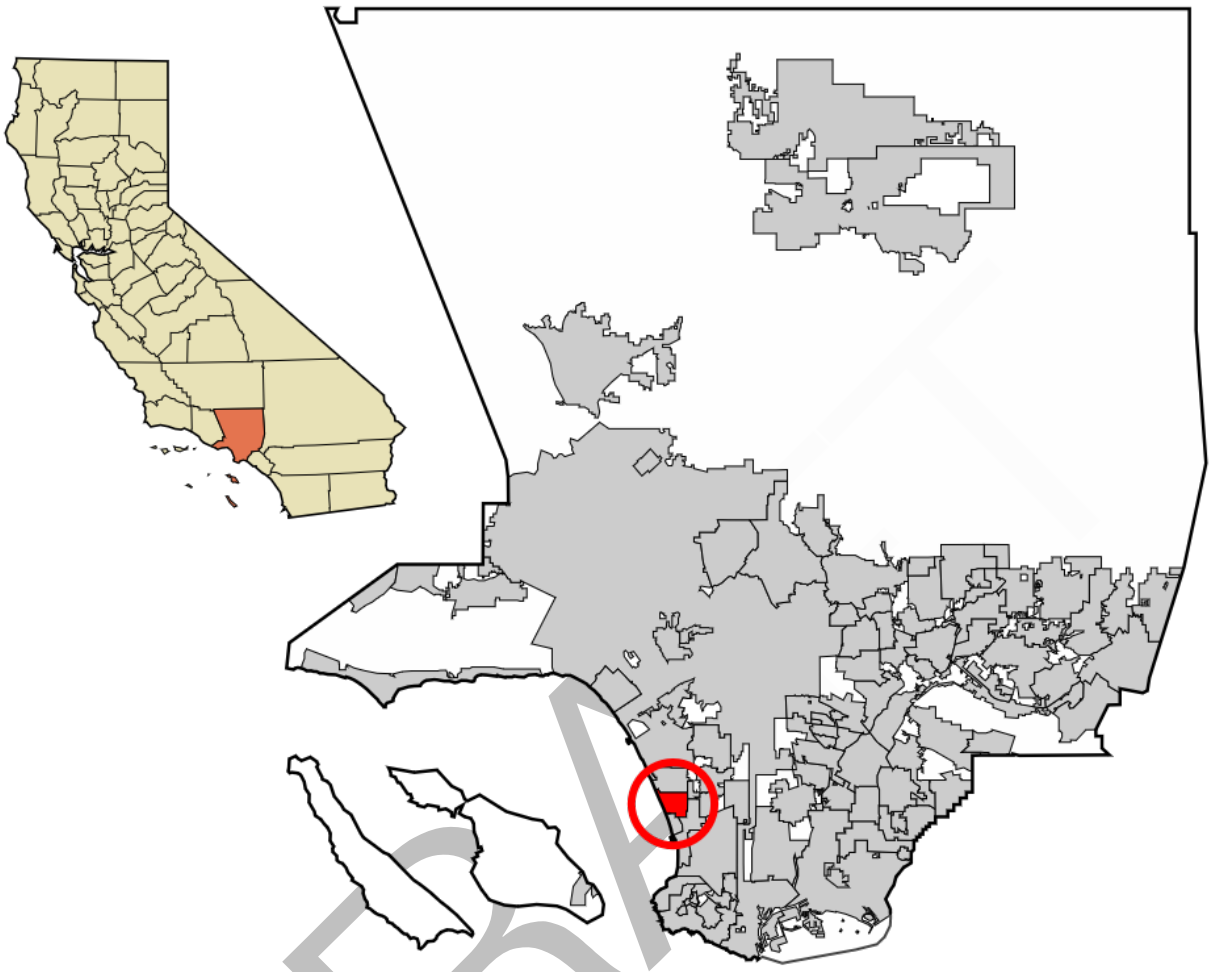

Figure 3-1
General Location of Manhattan beach
within the state of California and the
County of Los Angeles

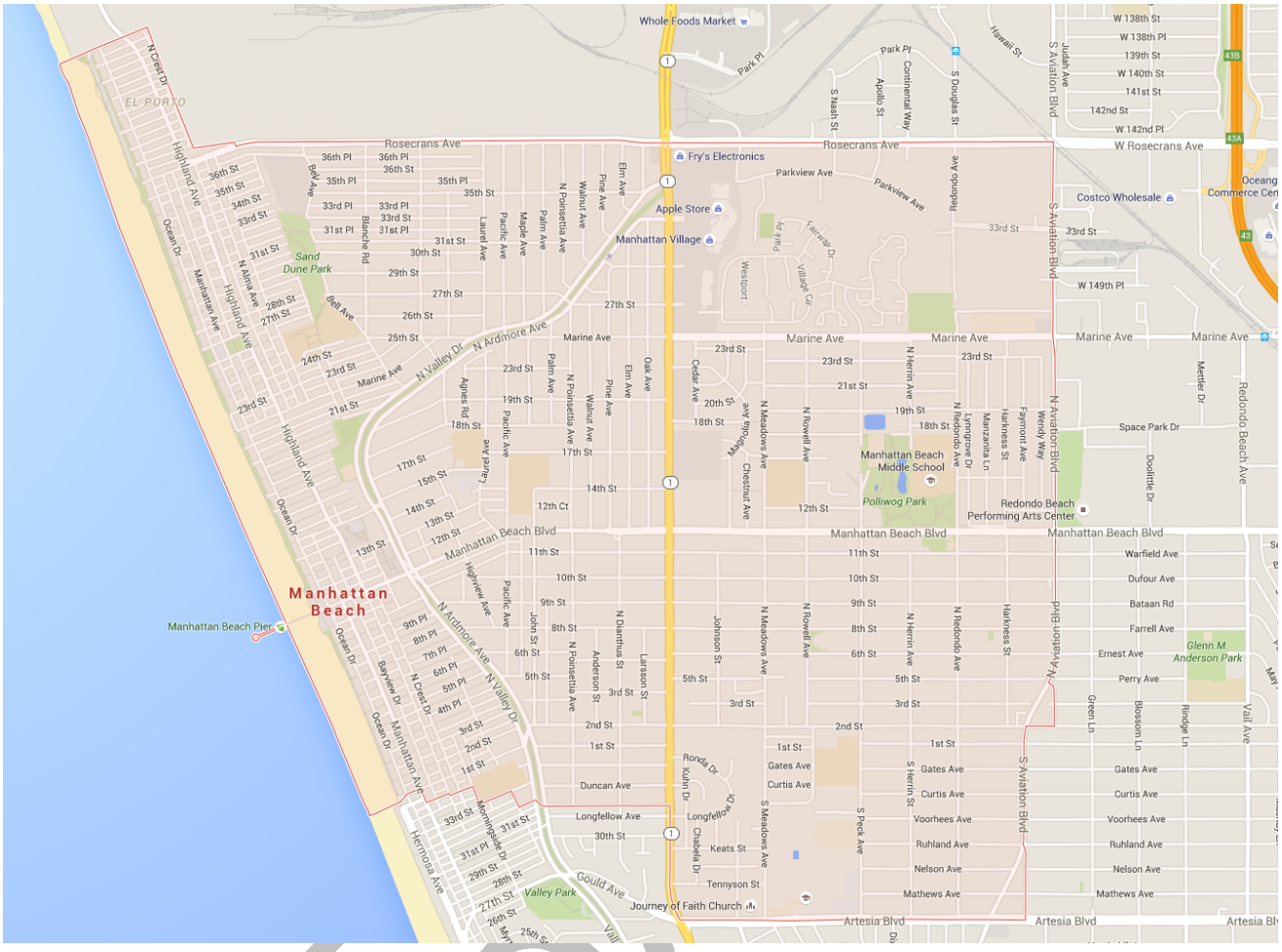

Figure 3-2
General boundaries of Manhattan Beach

3.2 Government

The city of Manhattan Beach is governed by a five-member City Council. City Council members are elected every four years. The office of the Mayor of Manhattan Beach rotates every ten months among the members of the City Council, so that each City Council member serves one term as Mayor. A City Manager is appointed by the City Council. An elected City Treasurer serves a four year term.

The Beach Cities Health District provides health and wellness services to the residents of Hermosa Beach, Manhattan Beach, and Redondo Beach. The voters of the three beach cities elect the 5-member Board of Directors to 4-year terms. One of 78 California Health Districts, it was created in 1955 as South Bay Hospital and took on its current name in 1993.

3.3 Demographics

The 2014 United States Census reported that Manhattan Beach had a population of 35,881. The population density was 8,914.7 people per square mile (3,442.0/km²). The racial makeup of Manhattan Beach was 29,686 (84.5%) White (79.3% Non-Hispanic White), 290 (0.8%) Black or African American (U.S. Census), 59 (0.2%) Native American, 3,023 (8.6%) Asian, 49 (0.1%) Pacific Islander, 409 (1.2%) from other races, and 1,619 (4.6%) from two or more races. Hispanic or Latino of any race were 2,440 persons (6.9%). The Census reported that 35,107 people (99.9% of the population) lived in households, 28 (0.1%) lived in non-institutionalized group quarters, and 0 (0%) were institutionalized.

There were 14,038 households, out of which 4,735 (33.7%) had children under the age of 18 living in them, 7,583 (54.0%) were opposite-sex married couples living together, 892 (6.4%) had a female householder with no husband present, 438 (3.1%) had a male householder with no wife present. There were 695 (5.0%) unmarried opposite-sex partnerships, and 85 (0.6%) same-sex married couples or partnerships. 3,627 households (25.8%) were made up of individuals and 1,078 (7.7%) had someone living alone who was 65 years of age or older. The average household size was 2.50. There were 8,913 families (63.5% of all households); the average family size was 3.10.

The population was spread out with 8,725 people (24.8%) under the age of 18, 1,740 people (5.0%) aged 18 to 24, 9,532 people (27.1%) aged 25 to 44, 10,681 people (30.4%) aged 45 to 64, and 4,457 people (12.7%) who were 65 years of age or older. The median age was 40.9 years. For every 100 females there were 100.4 males. For every 100 females age 18 and over, there were 99.2 males. There were 14,929 housing units at an average density of 3,787.9 per square mile (1,462.5/km²), of which 9,420 (67.1%) were owner-occupied, and 4,618 (32.9%) were occupied by renters. The homeowner vacancy rate was 0.8%; the rental vacancy rate was 5.3%. 25,587 people (72.8% of the population) lived in owner-occupied housing units and 9,520 people (27.1%) lived in rental housing units.

3.4 Land Use and Development Trends

Since its beginnings as a city in 1912, Manhattan Beach has attracted many to the sandy shoreline, the temperate climate and small-town character is a jewel of southern California. Maintaining the features that define the city requires forward thinking and planning, with particular emphasis on the City's neighborhoods, business districts, parks and streets. The Manhattan Beach General Plan identifies the community's vision for the collective future of the community. State of California statutes establish requiremetns and minimum content of a General Plan (Government Code Section 65350 to 65590). With incorporation of Manhattan Beach in 1912, the city's first planning commission was formed in 1923. Since that time a Local Planning Commission has developed and adopted the City's General Plan. The City Council adopted the City's General Plan on December 2, 2003 (Resolution No. 5872) and subsequently, in 2007, a new zoning ordinance. The last major section adopted was

the Housing Element of the General plan, adopted by the City Council on January 16, 2014 and certified and implemented on February 4, 2014. The City's land distribution is highlighted in Table 3-1 .

Table 3-1
Land Use Distribution – 2002

Use	Net Acres	% of Total
Residential	1,406	69.7%
Commercial	207	10.3%
Industrial	73	3.6%
Parks and Open Space (a)	146	7.3%
Public Faciltiies	142	7.0%
Other Uses (b)	43	2.1%
Total	2,017	100%

Notes: (a) Parks and Open Space does not include parking areas, such as the parking lots Adjacent to the Manhattan Beach Pier.
(b) Other Uses include parking losts, faith-based organizations, and vacant lots identified during the 2002 land use survey.

Manhattan Beach is a city of distinct and unique neighborhoods, the community recognizes: the Sand Section, Downtown, North End/El Porto, the Tree Section, the Hill Section, Manhattan Village and mall, and Eastside (Figure 3-1). Approximately 70% of the land area within the City was developed for residential use.

4.1 PLANNING PROCESS

This section provides an overview of the planning process; identifies Planning Team members, and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used in the development of this LHMP. Additional information regarding the Planning Team and public outreach efforts is provided in Appendices B and C.

The requirements for the planning process, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Planning Process

Planning Process

§201.6(b): An open public involvement process is essential to the development of an effective plan.

Documentation of the Planning Process

Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

Requirement §201.6(b)(1): An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

Requirement §201.6(b)(2): An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and

Requirement §201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Source: FEMA, October 2011.

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4.2 Overview of Planning Process

The City hired Constant & Associates to assist with the development of this LHMP. The first step in the planning process was to establish a Planning Team composed of existing City agencies; Battalion Fire Chief Scott Hafdell served as the primary point of contact for the City and the public.

Several existing plans and resources were consulted for the development of this plan, including resources developed by the Disaster Management Area Coordinators (DMAC) of Los Angeles County, the 2008

Manhattan Beach Hazard Mitigation Plan, the 2014 Los Angeles County Hazard Mitigation Plan, the 2013 Santa Monica Hazard Mitigation Plan, the 2014 San Francisco Hazard Mitigation Plan, and the 2015 City of Atascadero Hazard Mitigation Plan. The City acknowledges and appreciates the efforts of emergency managers and planners in these jurisdictions.

Once the Planning Team was formed, the following five-step planning process took place during the 5-month period from July 28, 2015 to December 2015.

- Organize resources: The Planning Team identified resources, including City staff, agencies, and local community members, which could provide technical expertise and historical information needed in the development of the LHMP.

- Access capabilities: The Planning Team reviewed current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards.

- Assessment risks: The Planning Team identified the hazards specific to the City, and Constant & Associates developed the risk assessment for the seven identified hazards. The Planning Team reviewed the risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy.

- Develop a mitigation strategy: After reviewing the current risks posed by each hazard, the Planning Team worked with the Consultant to develop a comprehensive range of potential mitigation goals, objectives, and actions. Subsequently, the Planning Team identified and prioritized the actions to be implemented.
- Monitor progress: The Planning Team developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to the community.

4.2.1 Review of 2008 City of Manhattan Beach Local Hazard Mitigation Plan Process

The Plans Team, Constant & Associates, and Batallion Fire Chief Scott Hafdell reviewed and analyzed the status of the Goals, Objectives and Potential Actions of the 2008 Local Hazard Mitigation Plan during the Planning Team Meeting of _____ (appendix F). The results of the analysis were used to determine and prioritize the 2016 Plan Mitigation Goals, Objectives and Potential Action.

At the same Planning Team Meeting Fire Chief Hafdell shared with the group Hazard Mitigation priorities of the City of Manhattan Beach. The Hazard Mitigation Priorities remained relatively unchanged from the previous Plan.

4.3 Hazard Mitigation Planning Team

This LHMP was developed over several months in 2015-2016 with contributions from City officials, emergency management professionals, and community input under the direction of the Hazard Mitigation Planning Team.

Several groups and personnel contributed to the development of this LHMP. The City of Manhattan Beach would like to thank the following members of the Hazard Mitigation Planning Team for their important contributions to developing this plan:

Table 4.1
City of Manhattan Beach Hazard Mitigation Planning Team

NAME	AGENCY/ORGANIZATION
Idris Al-Oboudi	Parks & Recreation
Jan Buike	Parks & Recreation
George Butts	CERT
Crystal Chambers	Constant & Associates
Frank Chiella	Fire Department
Scott Combs	Police Department
Leilani Emnace	Information Services
Gwen Eng	Finance Department
Scott Hafdell	Fire Department
Andy Harrod	Police Department
Ron McFarland	Building & Safety
Janna Payne	Human Resources
Tatyana Peltekova	Management Services
Jeffrey Robinson	Area G DMAC
Raul Saenz	Public Works
Bonnie Shrewsbury	GIS
Robbie Spears	Constant & Associates
Ashley Slight	Constant & Associates
Jim Sims	Constant & Associates
Liza Tamura	Management Services
Christine Tomikawa	Risk Manager

Table 4-1

4.3.1 Planning Team Meetings

There needs to be at least 3 meetings of the planning team to satisfy FEMA requirements. Need to list dates of meetings and what the planning team went over during each meeting.

4.2 Regional Coordination and Planning Participation

[Insert all records of regional coordination and sign in rosters, etc....]

4.4 Public Participation

The City of Manhattan Beach encouraged public participation and input in the Hazard Mitigation Plan by posting its activities on www.citymb.info and encouraging public feedback of the documents posted online. Below are comments gathered during the Public Participation phase of plan development:

Public feedback will be inserted here we need to show that we reached out to the public for public involvement in the planning process. There needs to be at least 3 documented meetings with the public

Copies of the Plan will be kept at the Community Development Office and Library. The existence and location of these copies will be publicized in the quarterly City newsletter, which reaches every resident and employee in the City. The plan also includes the address and the phone number of the Community Development Department, which is responsible for keeping track of public comments on the Plan.

In addition, copies of the plan and any proposed changes will be posted on the City website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

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

4.5 Outreach Strategy

4.5.1 Outreach Strategy Framework

4.5.2 Public Involvement in the Planning Process

4.6 Available Resources

The Resource Directory provides contact information for local, regional, state, and Federal programs that are currently involved in hazard mitigation activities. The Planning Team may look to the organizations on the following pages for resources and technical assistance when making determinations on further pursuing projects and activities related to hazard mitigation. The Resource Directory provides a foundation for potential partners in action item implementation.

American Public Works Association			
Level: National	Hazard: Multi	http://www.apwa.net	
2345 Grand Boulevard		Suite 500	
Kansas City, MO 64108-2641		Ph: 816-472-6100	Fx: 816-472-1610
Notes: The American Public Works Association is an international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.			

Association of State Floodplain Managers			
Level: Federal	Hazard: Flood	www.floods.org	
2809 Fish Hatchery Road			
Madison, WI 53713		Ph: 608-274-0123	Fx:
Notes: The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery			

Building Seismic Safety Council (BSSC)			
Level: National	Hazard: Earthquake	www.bssconline.org	
1090 Vermont Ave., NW		Suite 700	
Washington, DC 20005		Ph: 202-289-7800	Fx: 202-289-109
Notes: The Building Seismic Safety Council (BSSC) develops and promotes building earthquake risk mitigation regulatory provisions for the nation.			

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

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

CalFire			
Level: State	Hazard: Multi	http://www.fire.ca.gov/php/index.php	
210 W. San Jacinto			
Perris CA 92570		Ph: 909-940-6900	Fx:

Notes: CalFire protects over 31 million acres of California's privately-owned wildlands. California Department of Forestry and Fire Protection emphasizes the management and protection of California's natural resources.			
California Division of Mines and Geology (DMG)			
Level: State	Hazard: Multi	www.consrv.ca.gov/cgs/index.htm	
801 K Street		MS 12-30	
Sacramento, CA 95814		Ph: 916-445-1825	Fx: 916-445-5718
Notes: The California Geological Survey develops and disseminates technical information and advice on California''s geology, geologic hazards, and mineral resources.			
California Environmental Resources Evaluation System (CERES) (waiting on confirmation)			
Level: State	Hazard: Multi	http://ceres.ca.gov/	
900 N St.		Suite 250	
Sacramento, Ca. 95814		Ph: 916-653-2238	Fx:
Notes: CERES is an excellent website for access to environmental information and websites.			
California Department of Water Resources (DWR)			
Level: State	Hazard: Flood	http://wwwdwr.water.ca.gov/	
1416 9th Street			
Sacramento, CA 95814		Ph: 916-653-6192	Fx:
Notes: The Department of Water Resources manages the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.			
California Department of Conservation: Southern California Regional Office			
Level: State	Hazard: Multi	http://www.conservation.ca.gov/	
655 S. Hope Street		#700	
Los Angeles, CA 90017-2321		Ph: 213-239-0878	Fx: 213-239-0984
Notes: The Department of Conservation provides services and information that promote environmental health, economic vitality, informed land-use decisions and sound management of our state's natural resources.			
California Governor's Office of Planning and Research			
Level: State	Hazard: Multi	www.opr.ca.gov	
1400 Tenth Street			
Sacramento, CA 95814		Ph: 916-322-2318	Fx:

Notes: The Governor's Office of Planning and Research (OPR) publishes basic information on local planning agencies, known as the California Planners' Book of Lists. This local planning information is available on-line with new search capabilities and up-to-the- minute updates.			
Environmental Protection Agency, Region 9			
Level: Regional	Hazard: Multi	http://www2.epa.gov/aboutepa/epa-region-9-pacific-southwest	
75 Hawthorne Street			
San Francisco, CA 94105		Ph: 415-947-8000	Fx: 415-947-3553
Notes: The mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment through the themes of air and global climate change, water, land, communities and ecosystems, and compliance and environmental stewardship.			
Federal Emergency Management Agency, Region IX			
Level: Federal	Hazard: Multi	https://www.fema.gov/fema-region-ix-mitigation-division	
1111 Broadway		Suite 1200	
Oakland, CA 94607		Ph: 510-627-7100	Fx: 510-627-7112
Notes: The Federal Emergency Management Agency is tasked with responding to, planning for, recovering from and mitigating against disasters.			
Federal Emergency Management Agency, Mitigation Division			
Level: Federal	Hazard: Multi	http://www.fema.gov/what-mitigation/federal-insurance-mitigation-administration	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.			
Floodplain Management Association			
Level: Federal	Hazard: Flood	www.floodplain.org	
P.O. Box 50891			
Sparks, NV 89435-0891		Ph: 775-626-6389	Fx: 775-626-6389
Notes: The Floodplain Management Association is a nonprofit educational association. It was established in 1990 to promote the reduction of flood losses and to encourage the protection and enhancement of natural floodplain values. Members include representatives of federal, state and local government agencies as well as private firms.			

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

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

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

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

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

MyHazards			
Level: State, Local	Hazard: Multi	http://myhazards.calema.ca.gov	
3650 Schriever Avenue			
Mather, CA 95655		Ph: 916-845-8136	Fx:
Notes: Natural hazards are a part of living in California. The My Hazards Maping Tool, allows citizens to enter their address and it will determine their individual risk to earthquake, flood, fire and tsunami.			

National Earthquake Hazards Reduction Program			
Level: Federal	Hazard: Earthquake	http://www.nehrp.gov/index.htm	
NIST, 100 Bureau Drive,		Stop 1070	
Gaithersburg, MD 20899-1070		Ph: 301-975-6478	Fx:
Notes: The National Earthquake Hazards Reduction Program (NEHRP) was established by the U.S. Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law (PL) 95–124. At the time of its creation, Congress' stated purpose for NEHRP was "to reduce the risks of life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program." NEHRP is a conglomeration of four federal agencies, FEMA, NIST, NSF and USGS			

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

National Resources Conservation Service		
Level: Federal	Hazard: Multi	http://www.nrcs.usda.gov/

14th and Independence Ave., SW	Room 5105-A	
Washington, DC 20250	Ph: 202-720-7246	Fx: 202-720-7690
Notes: NRCS assists owners of America's private land with conserving their soil, water, and other natural resources, by delivering technical assistance based on sound science and suited to a customer's specific needs. Cost shares and financial incentives are available in some cases.		
National Interagency Fire Center (NIFC)		
Level: Federal	Hazard: Wildfire	www.nifc.gov
3833 S. Development Ave.		
Boise, Idaho 83705-5354	Ph: 208-387- 5512	Fx:
Notes: The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations.		
National Fire Protection Association (NFPA)		
Level: National	Hazard: Wildfire	http://www.nfpa.org/catalog/home/index.asp
1 Batterymarch Park		
Quincy, MA 02169-7471	Ph: 617-770-3000	Fx: 617 770-0700
Notes: The mission of the international nonprofit NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically-based consensus codes and standards, research, training and education		
National Floodplain Insurance Program (NFIP)		
Level: Federal	Hazard: Flood	http://www.fema.gov/national-flood-insurance-program
500 C Street, S.W.		
Washington, D.C. 20472	Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.		
National Oceanic and Atmospheric Administration		
Level: Federal	Hazard: Multi	www.noaa.gov
14th Street & Constitution Ave NW	Rm 6013	
Washington, DC 20230	Ph: 202-482-6090	Fx: 202-482-3154
Notes: NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.		
National Tsunami Warning Center (NTWC)		

Level: Federal	Hazard:Tsunami	http://	
910 S. Felton St.			
Palmer, AK 99645		Ph: 907-745-4212	Fx: 907-745-6071
Notes: The Palmer Observatory, under the auspices of the Coast and Geodetic Survey, was established in Palmer, Alaska in 1967 as a direct result of the great Alaskan earthquake that occurred in Prince William Sound on March 27, 1964. In 2003, a new Tsunami Warning Center building was constructed in the yard of the original building. Following the devastating Indian Ocean Tsunami in late 2004, the NTWC expanded its scope to the U.S. Atlantic and Gulf of Mexico coasts, Puerto Rico, the Virgin Islands, and the Atlantic coast of Canada.			
National Weather Service, Office of Hydrologic Development			
Level: Federal	Hazard: Flood	http://www.nws.noaa.gov/oh/	
1325 East West Highway		SSMC2	
Silver Spring, MD 20910		Ph: 301-713-1658	Fx: 301-713-0963
Notes: The Office of Hydrologic Development (OHD) enhances National Weather Service products by: infusing new hydrologic science, developing hydrologic techniques for operational use, managing hydrologic development by NWS field office, providing advanced hydrologic products to meet needs identified by NWS customers			
National Weather Service			
Level: Federal	Hazard: Multi	http://www.nws.noaa.gov/	
520 North Elevar Street			
Oxnard, CA 93030		Ph: 805-988- 6615	Fx:
Notes: The National Weather Service is responsible for providing weather service to the nation. It is charged with the responsibility of observing and reporting the weather and with issuing forecasts and warnings of weather and floods in the interest of national safety and economy. Briefly, the priorities for service to the nation are: 1. protection of life, 2. protection of property, and 3. promotion of the nation's welfare and economy.			
San Gabriel Valley Economic Partnership			
Level: Regional	Hazard: Multi	www.valleyconnect.com	
4900 Rivergrade Road		Suite A310	
Irwindale, CA 91706		Ph: 626-856-3400	Fx: 626-856-5115
Notes: The San Gabriel Valley Economic Partnership is a non-profit corporation representing both public and private sectors. The Partnership is the exclusive source for San Gabriel Valley-specific information, expertise, consulting, products, services, and events. It is the single organization in the Valley with the mission to sustain and build the regional economy for the mutual benefit of all thirty cities, chambers of commerce, academic institutions, businesses and residents.			
Sanitation Districts of Los Angeles County			
Level: County	Hazard: Flood	http://www.lacsd.org	

1955 Workman Mill Road			
Whittier, CA 90607		Ph:562-699-7411 x2301	Fx:
Notes: The Sanitation Districts provide wastewater and solid waste management for over half the population of Los Angeles County and turn waste products into resources such as reclaimed water, energy, and recyclable materials.			
Santa Monica Mountains Conservancy			
Level: Regional	Hazard: Multi	http://smmc.ca.gov/	
570 West Avenue Twenty-Six		Suite 100	
Los Angeles, CA 90065		Ph: 323-221-8900	Fx:
Notes: The Santa Monica Mountains Conservancy helps to preserve over 55,000 acres of parkland in both wilderness and urban settings, and has improved more than 114 public recreational facilities throughout Southern California.			
South Bay Economic Development Partnership			
Level: Regional	Hazard: Multi	www.southbaypartnership.com	
3858 Carson Street		Suite 110	
Torrance, CA 90503		Ph: 310-792-0323	Fx: 310-543-9886
Notes: The South Bay Economic Development Partnership is a collaboration of business, labor, education and government. Its primary goal is to plan an implement an economic development and marketing strategy designed to retain and create jobs and stimulate economic growth in the South Bay of Los Angeles County.			
South Coast Air Quality Management District (AQMD)			
Level: Regional	Hazard: Multi	www.aqmd.gov	
21865 E. Copley Drive			
Diamond Bar, CA 91765		Ph: 800-CUT-SMOG	Fx:
Notes: AQMD is a regional government agency that seeks to achieve and maintain healthful air quality through a comprehensive program of research, regulations, enforcement, and communication. The AQMD covers Los Angeles and Orange Counties and parts of Riverside and San Bernardino Counties.			
Southern California Earthquake Center (SCEC)			
Level: Regional	Hazard: Earthquake	www.scec.org	
3651 Trousdale Parkway		Suite 169	
Los Angeles, CA 90089-0742		Ph: 213-740-5843	Fx: 213/740-0011

Notes: The Southern California Earthquake Center (SCEC) gathers new information about earthquakes in Southern California, integrates this information into a comprehensive and predictive understanding of earthquake phenomena, and communicates this understanding to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives.			
Southern California Association of Governments (SCAG)			
Level: Regional	Hazard: Multi	www.scag.ca.gov	
818 W. Seventh Street		12th Floor	
Los Angeles, CA 90017		Ph: 213-236-1800	Fx: 213-236-1825
Notes: The Southern California Association of Governments functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.			
State Fire Marshal (SFM)			
Level: State	Hazard: Wildfire	http://osfm.fire.ca.gov	
1131 "S" Street			
Sacramento, CA 95814		Ph: 916-445-8200	Fx: 916-445-8509
Notes: The Office of the State Fire Marshal (SFM) supports the mission of the California Department of Forestry and Fire Protection (CDF) by focusing on fire prevention. SFM regulates buildings in which people live, controls substances which may, cause injuries, death and destruction by fire; provides statewide direction for fire prevention within wildland areas; regulates hazardous liquid pipelines; reviews regulations and building standards; and trains and educates in fire protection methods and responsibilities.			
The Community Rating System (CRS)			
Level: Federal	Hazard: Flood	http://www.fema.gov/community-rating-system	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimum requirements of the NFIP. Property owners within the County would receive reduced NFIP flood insurance premiums if the County implements floodplain management practices that qualify it for a CRS rating. For further information on the CRS, visit FEMA's website.			
United States Geological Survey			
Level: Federal	Hazard: Multi	http://www.usgs.gov/	
345 Middlefield Road			
Menlo Park, CA 94025		Ph: 650-853-8300	Fx:

Notes: The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.			
US Army Corps of Engineers			
Level: Federal	Hazard: Multi	http://www.usace.army.mil	
P.O. Box 532711			
Los Angeles CA 90053- 2325		Ph: 213-452- 3921	Fx:
Notes: The United States Army Corps of Engineers work in engineering and environmental matters. A workforce of biologists, engineers, geologists, hydrologists, natural resource managers and other professionals provide engineering services to the nation including planning, designing, building and operating water resources and other civil works projects.			
USDA Forest Service			
Level: Federal	Hazard: Wildfire	http://www.fs.fed.us	
1400 Independence Ave. SW			
Washington, D.C. 20250-0002		Ph: 202-205-8333	Fx:
Notes: The Forest Service is an agency of the U.S. Department of Agriculture. The Forest Service manages public lands in national forests and grasslands.			
USGS Water Resources			
Level: Federal	Hazard: Multi	http://www.usgs.gov/water/	
6000 J Street		Placer Hall	
Sacramento, CA 95819-6129		Ph: 916-278-3000	Fx: 916-278-3070
Notes: The USGS Water Resources mission is to provide water information that benefits the Nation's citizens: publications, data, maps, and applications software.			
Western States Seismic Policy Council (WSSPC)			
Level: Regional	Hazard: Earthquake	www.wsspc.org/home.html	
125 California Avenue		Suite D201, #1	
Palo Alto, CA 94306		Ph: 650-330-1101	Fx: 650-326-1769
Notes: WSSPC is a regional earthquake consortium funded mainly by FEMA. Its website is a great resource, with information clearly categorized – from policy to engineering to education.			

SECTION 5 COMMUNITY CAPABILITIES

5.1 Capability Assessment

5.2 Documentation of Community Capabilities

More information on current Manhattan Beach capabilities will be included here, per FEMA requirements

5.3 Existing Authorities, Policies, Programs, and Resources

SECTION 6 RISK ASSESSMENT

6.0 Risk Assessment Methodology

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

The Planning Team considered a range of natural hazards facing the region including earthquakes, flooding, landslide, tsunami, climate change, and adverse weather. The attached Ranking Your Hazards-Figure 6-1 was used by the Team to prioritize the natural hazards with the highest probability of impacting the City of Manhattan Beach. The Team agreed that any hazard receiving a Team score higher than "3" would be included in the Natural Hazards Mitigation Plan. Utilizing the ranking technique, the Team identified earthquake, flood, landslide, and tsunami as the most prominent hazards facing the City.

The geographic extent of each of the identified hazards has been identified by the City of Manhattan Beach utilizing the maps contained in the City's General Plan, City's Emergency Operations Plan, and the County's

Hazard Type	Should it be profiled		Explanation	Hazard Profile	Historical Occurrence	Declared Disaster	Casualties	Damage	Potential Source
	Yes	No							
Coastal Erosion		X	City is not located along the coast	N/A	N/A	N/A	N/A	N/A	N/A
Coastal Storm		X	City is not located along the coast	N/A	N/A	N/A	N/A	N/A	N/A
Drought	X		Existing infrastructure for water storage and delivery with the City diminish the effects of the hazard.	Droughts have impacts on the environment, agriculture, health, economic and the social fabric of the community.	N/A	N/A	N/A	N/A	N/A

Hazard Mitigation Plan. The vulnerabilities posed by these hazards are depicted in Table 6-1 below

Earthquake (Seismic)	X		City has experienced recent (2003 San Simeon) and historic earthquakes. The City is in the proximity of the San Andreas fault.	Major Faults in the area cause the City to be vulnerable to earthquakes.	2003	Yes	0	$50. 4	Area Faults
Expansive Soils	X		Expansive soils have caused problems, especially after the 2003 San Simeon earthquake	The City is vulnerable to Expansive Soils as a result of Earthquakes and flooding.	2003	Yes	0	N/A	Area Faults
Extreme Heat		X	While extreme temperatures are known to occur, prolonged heat waves are rare.	N/A	N/A	N/A	N/A	N/A	N/A
Flood	X		History of flooding is associated with heavy rainfall.	The City is exposed to riverine flooding as a result to heavy rain.	1969 2001	No	0	N/A	Rains
Land Subsidence	X		City is vulnerable to slope instability, especially after prolonged rainfalls.	Heavy rains would cause slope instability in various area of the City.	2010	No	0	100 K	Rains Wildlan d fires
Windstorm	X		Winds up to 75 mph have on occasion impacted the City.	Windstorms impact the health and safety of the community as a result of flying debris.				Minor	Winds

Table 6-1: Vulnerability: Location, Extent, and Probability*

Insert Vulnerability table here

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 four hazards profiled in the mitigation plan, including Earthquake, Flood, Landslide, and Tsunami. The Federal criteria for risk assessment and information on how the City of Manhattan Beach Hazard Mitigation Plan meets those criteria is outlined in Table 6-2 below.

Table 6-2: Federal Criteria for Risk Assessment

SECTION 322 PLAN	HOW IS THIS ADDRESSED?
Identifying Hazards	Each hazard section includes an inventory of the best available data sources that identify hazard areas. To the extent data are available; the existing maps identifying the location of the hazard were utilized. The Executive Summary and the Risk Assessment sections of the plan include a list of the hazard maps.
Profiling Hazard Events	Each hazard section includes documentation of the history, and causes and characteristics of the hazard in the City.

Assessing Vulnerability: Identifying Assets	Where data is available, the vulnerability assessment for each hazard addressed in the mitigation plan includes an inventory of all publicly owned land within hazardous areas. Each hazard section provides information on vulnerable areas within the City. Each hazard section also identifies potential mitigation strategies.
Assessing Vulnerability: Estimating Potential Losses	The Risk Assessment Section of this mitigation plan identifies key critical facilities that provide services to the City and includes a map of these facilities. Assessments have been completed for the hazards addressed in the plan, and quantitative estimates were made for each hazard where data was available.
Assessing Vulnerability: Analyzing Development Trends	The Community Profile Section of this plan provides a description of the population trends and transportation patterns.

6.1 Areas of Interest and Special Events

Facilities critical to government response and recovery activities (i.e., life safety and property and environmental protection) include: local government 911 centers, local government emergency operations centers, schools (hosting shelters), local police and fire stations, local public works facilities, local communications centers, hospitals, bridges and major roads, and shelters. Also, facilities that, if damaged, could cause serious secondary impacts may also be considered "critical". A hazardous materials facility is one example of this type of critical facility.

Essential facilities are those facilities that are vital to the continued delivery of key City services or that may significantly impact the City's ability to recover from the disaster. These facilities may include: buildings such as jails, law enforcement center, public services building, community corrections center, courthouses, and juvenile services buildings or other public facilities such as schools. The following Table 4-3 illustrates the critical and essential facilities providing services to the City of Manhattan Beach. Note that secondary impacts associated with earthquake hazards have been included on a site-by-site basis.

]Table 6-3: City of Manhattan Beach Critical and Essential Facilities Vulnerable to Hazards

EQ	FL	LN	TS	FACILITY	ADDRES
X	X			City Hall	1400 Highland Avenue
X	X	X		Public Works Yard	3621 Bell Avenue
X	X			Library (LA County)	1320 Highland Avenue
X	X			Creative Arts Center	1560 Manhattan Beach Boulevard
X				Joslyn Community Center	1601 Valley Drive
X	X			National Guard Armory (Federal)	3601 Bell Avenue
X				Water Tower	Rowell Avenue/ 6th Street
X	X			Mira Costa High School	700 South Peck Avenue
X				Manhattan Beach Middle School	1501 Redondo Avenue
X	X			Grandview Elementary	455 24th Street
X				Pacific Elementary	1431 15th Street
X	X			Robinson Elementary	80 S. Morningside Drive
X				Meadows Elementary	1200 Meadows Avenue
X				Pennekamp Elementary	110 South Rowell Avenue

X				Manhattan Beach Transition School	1435 15th Street
X	X			Fire Station 1/Police Station	420 15th Street
X				Fire Station 2	1400 Manhattan Beach Boulevard
X				Ross Manhattan Terrace (Senior Housing)	3400 Valley Drive
X				Manhattan Village Senior Villas	1300 Park View Avenue
X	X			Manhattan Heights Center	1600 Manhattan Beach Boulevard
X				Northrop Grumman	3001 Aviation Boulevard

(X = site's risk rating is "possible, likely, or highly likely")
(Key: EQ = Earthquake, Fld = Flood, Lnd = Landslide, Tsu = Tsunami)

6.2 Calculated Priority Risk Index (CPRI)

The Calculated Priority Risk Index is a FEMA-recommended ranking method that allows disparate hazard categories to be compared. CPRI is obtained by assigning values to risk categories:

- Probability (45%)
- Magnitude/Severity (30%)
- Warning Time (15%)
- Duration (10%)

For each of the risk categories, there are four varying degrees of risk from which to choose: 1, 2, 3, or 4. Zero (0) is the value used when an option is not assigned.

CPRI Category	Degree of Risk			Assigned Weighting Factor
Probability	Unlikely	Extremely rare, with no documented history of occurrences or events. Annual probability of less than 1 in 1,000 years (<0.1%).	1	45%
	Possible	Rare occurrences. Annual probability of between 1 in 100 years and 1 in 1,000 years (0.1%-1%)	2	
	Likely	Occasional occurrences, with at least 2 or more documented historic events. Annual probability of between 1 in 10 years and 1 in 100 years (1%-10%).	3	
	Highly Likely	Frequent events, with a well-documented history of occurrence. Annual probability of greater than 1 every year (>10%).	4	
Magnitude/ Severity	Negligible	Negligible property damages (less than 5% of critical and non- critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible loss of quality of life. Shutdown of critical public facilities for less than 24 hours.	1	30%
	Limited	Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shutdown of critical public facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shutdown of critical public facilities for more than 1 week and less than 1 month	3	
	Catastrophic	Severe property damage (greater than 50% of critical and non- critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths. Shutdown of critical public facilities for more than 1 month	4	

Warning Time	More than 24 hours	Population will receive greater than 24 hours of warning.	1	15%
	12–24 hours	Population will receive 12–24 hours of warning.	2	

CPRI Category	Degree of Risk			Assigned Weighting Factor
	6–12 hours	Population will receive 6–12 hours of warning.	3	15%
	Less than 6 hours	Population will receive less than 6 hours of warning.	4	
Duration	Less than 6 hours	Disaster event will last less than 6 hours.	1	10%
	Less than 24 hours	Disaster event will last 6–24 hours.	2	
	Less than 1 week	Disaster event will last between 24 hours and 1 week.	3	
	More than 1 week	Disaster event will last more than 1 week	4	

6.2.1 City of Manhattan Beach Hazard Score

Hazard	Probability		Magnitude/Severity		Warning Time		Duration		
	Score	Weight (45%)	Score	Weight (30%)	Score	Weight (15%)	Score	Weight (10%)	Weighted Total
Earthquake	3	1.35	4	1.2	4	0.6	1	0.1	3.25
Flooding	3	1.35	3	0.9	3	0.45	3	0.3	3.00
Landslide	3	1.35	2	0.6	4	0.6	1	0.1	2.65
Tsunami	2	0.90	3	0.9	4	0.6	1	0.1	2.50
Windstorm	1	0.20	2	0.6	2	0.3	2	0.2	1.30
Drought	1	0.20	2	0.6	2	0.3	4	0.4	1.50
Other Hazard: Terrorism	1	0.20	2	0.6	4	0.6	1	0.1	1.50
Other Hazard: Hazardous	1	0.20	2	0.6	4	0.6	1	0.1	1.50
Other Hazard: Urban Fire	1	0.20	2	0.6	4	0.6	1	0.1	1.50
CPRI Total	16	5.95	22	6.6	31	4.65	15	1.5	18.7

6.3 Hazards Profile

6.3.1 Earthquake

Earthquakes are a long-recognized hazard throughout California. Southern California's best known fault, the San Andreas fault, is a 400-mile long fault line running from the Mexican border to west of San Francisco. The San Andreas is capable of producing earthquakes with a magnitude of 8 or greater on the Richter scale. Numerous other fault lines have been identified in Southern California that could also have a significant impact on Manhattan Beach. These faults include Newport-Inglewood, Whittier, Chatsworth, Hollywood, Los Alamitos, and Palos Verdes. Beyond the known faults, there are potentially other "blind" faults that exist, unidentified at this time, in Southern California.

Manhattan Beach, like most of the Los Angeles Basin, lies over one or more known earthquake faults, and potentially many more unknown faults, particularly the so-called lateral or blind thrust faults.

Although no surface faults are known to pass through Manhattan Beach, the City does lie above the Compton Thrust Fault. This type of fault does not rupture all the way up to the surface, so there is no evidence of it on the ground. It is "buried" under the uppermost layers of rock in the crust. In addition, several regional potentially active faults nearby can produce enough shaking to significantly damage structures and cause loss of life.

The Los Angeles Basin has a history of powerful and relatively frequent earthquakes, dating back to the 8.0+ San Andreas earthquake of 1857 which did substantial damage to the relatively few buildings that existed at the time. Paleo seismological research indicates that large (8.0+) earthquakes occur on the San Andreas fault at intervals between 45 and 332 years with an average interval of 140 years[1]. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the Long Beach Earthquake of 1933, the San Fernando Earthquake of 1971, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

To date, the City has retrofitted 100% of proposed structures. Given the retrofitting program, the number of buildings at risk has been decreased significantly. Even though the critical facilities may be better off that does not change the fact that people live in un-reinforced masonry buildings vulnerable to damage from earthquakes. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of un-reinforced masonry buildings.

Major federal, state, and local government agencies and private organizations support earthquake risk reduction, and have made significant contributions in reducing the adverse impacts of earthquakes. Despite the progress, the majority of California communities remain unprepared because there is a general lack of understanding regarding earthquake hazards among Californians.

Table 6-4: Earthquake Magnitude and Intensity Comparison
(Source: Manhattan Beach Emergency Operations Plan)

Descriptor	Magnitude	Intensity	Description
Very Minor	1.0 - 3.0	I	I. Not felt except by a very few under especially favorable conditions.
Minor	3.0 - 3.9	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
Light	4.0 - 4.9	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
Moderate	5.0 - 5.9	VI - VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
Strong	6.0 - 6.9	VIII - IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
Major Great	7.0 -7.9 8.0and higher	X - XII	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: United States Geological Survey (USGS) National Earthquake Information Center, (http://neic.usgs.gov/neis/general/handouts/mag_vs_int.html), October 2002.

Notes:
(1) Intensity in Manhattan Beach will vary greatly depending on where the epicenter of the earthquake is located. The closer the epicenter is to Manhattan Beach, the higher the intensity scale.
(2) A specific kind of reverse fault in which the dip of the fault is less than 45 degrees over much if not all of its length. It is characterized not so much by vertical displacement, but by horizontal compression.
(3) Holocene: The most recent geologic era; from about 10,000 years ago to the present.
(4) Quaternary: Late Quaternary refers to the time between 700,000 years ago and the present day.

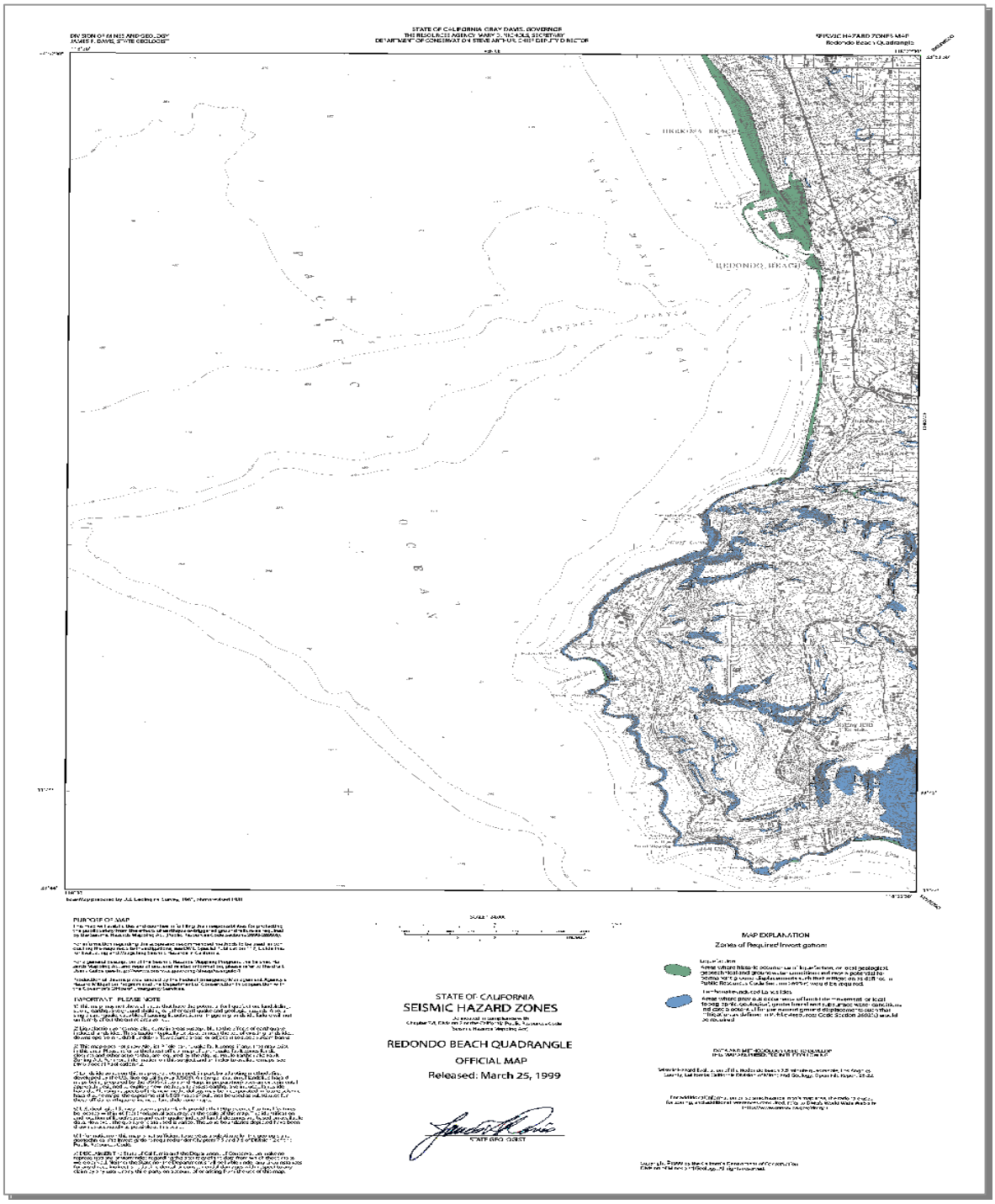
The impact of an earthquake will vary widely based on the magnitude of the earthquake and the location of the epicenter. In addition to major ground shaking, the earthquake may injure or kill community members, cause broken or buckled roadways, result in widespread power outages, and may disrupt many other utilities and City services. The secondary impacts of a major earthquake could significantly impact a wide variety of locations and services throughout Manhattan Beach.

Table 6.5: Magnitude and Intensity of Maximum Credible Earthquake for Faults Potentially Impacting Manhattan Beach

Regional Fault Name	Distance to Manhattan Beach (miles)	Magnitude of MCE	Intensity Range of MCE (1)	Last Major Rupture
Compton Thrust Fault(2)	0.0	6.8	VIII-IX	N/A
Palos Verdes Fault	2.0 offshore 4.0 onshore	7.1	X-XII	Holocene(3), offshore
Newport-Inglewood Fault	4.5	6.9	VIII-IX	March 10, 1933, 6.4M – Long Beach
Santa Monica Fault	11.0	6.6	VIII-IX	Late Quaternary(4)
Malibu Coast Fault	15.0	6.7	VIII-IX	Holocene, in part;
San Andreas	47.0	7.1-7.8	X-XII	January 9, 1857 (Mojave

Source: Southern California Earthquake Data Center, http://www.scecdc.scec.org/.

*Note – per the California Office of Emergency Services (CalOES) MyHazards mapping tool, Manhattan Beach is at risk for high ground shaking. Manhattan Beach is outside of the earthquake-induced landslide hazard zone, and outside of the liquefaction seismic hazard zone.


STATE OF CALIFORNIA GRAY DAVIS, GOVERNOR
THE RESOURCES AGENCY MARY D. NICHOLS, SECRETARY
DEPARTMENT OF CONSERVATION STEVE ARTHUR, CHIEF DEPUTY DIRECTOR
DIVISION OF MINES AND GEOLOGY
JAMES F. DAVIS, STATE GEOLOGIST
SEISMIC HAZARD ZONES MAP
Redondo Beach 7.5 Quadrangle
HERMOSA BEACH
REDONDO BEACH
PURPOSE OF MAP
IMPORTANT PLEASE NOTE
SCALE 1:24,000
MAP EXPLANATION
Zones of Required Investigation
STATE OF CALIFORNIA
SEISMIC HAZARD ZONES
REDONDO BEACH QUADRANGLE
OFFICIAL MAP
Released: March 25, 1999
GRAY DAVIS
GOVERNOR

Map 6-1

6.3.2 Flood

Flooding poses a threat to life and safety, and can cause severe damage to public and private property. There are various locations throughout Manhattan Beach that can be affected by localized flooding and flooding due to storm surges. While there is no significant history of major flooding in Manhattan Beach, localized flooding caused by heavy rains and storm surge has occurred.

Localized flooding can render roads unusable. A severe winter storm has the potential to disrupt the daily driving routine of hundreds of thousands of people. In addition to posing a hazard to structures, floods can disrupt automobile traffic, including emergency vehicles and shut down local and regional transit systems.

In the last 125 years, the average annual rainfall in the region is 13.1 inches. But the term "average" means very little because there is a fluctuation rate in the coastal rains as high as thirty percent in forty-five out of every one hundred years, which is coupled with a highly seasonal rainfall pattern with only fifteen percent falling during the hottest six months of the year.

Another relatively regular source for heavy rainfall, particularly in nearby mountains and foothills is from summer tropical storms. These tropical storms usually coincide with El Niño years.

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.

As a region, the majority of buildable portions of Los Angeles County are developed. This leaves very 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 flood control systems including concrete lined river and stream beds, flooding would be a much more common occurrence. 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.

Urban flooding is the biggest flooding threat to the City. In addition, any low-lying areas have a potential for ponding. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's capability to remove it.

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

The City of Manhattan Beach has a high concentration of impermeable surfaces that either collect water, or concentrate the flow of water in unnatural channels. Storm drains may back up with vegetative debris causing additional, localized flooding. Map 6-1 illustrates the local urban flooding areas in the City of Manhattan Beach.

Low lying coastal communities of Southern California have one other source of flooding, coastal flooding. This occurs most often during storms that bring higher than normal tides. Storms, the time of year and the tidal cycle can sometimes work to bring much higher than normal tides which cause flooding in low lying coastal areas. Map 6-2 illustrates the local coastal flooding areas in the City of Manhattan Beach.

Historically, flooding in the City has been the result of heavy rainstorms with specific damages occurring along the coastal areas and low lying parts of the City. One of the earliest recorded natural hazards to damage the City was in approximately 1913 which damaged the City pier and other structures near the ocean.

No portions of Manhattan Beach lie within any federally designated flood zone. Under average rainstorms, the City's infrastructure normally prevents flooding. Localized small-scale flooding represents the only concern. Historically, localized flooding during heavier storms has resulted in some property damage. For example, the Southern California area received some of the heaviest rain on record in 2004-05. This heavy rain produced flooding around the Polliwog Park neighborhood. The lake at Polliwog Park, which acts as a natural detention basin, overflowed due to extensive rain causing some flooding within a 1 block radius around the park.

The largest impact on communities from flood events is the loss of life and property. During certain years, property losses resulting from flood damage are extensive.

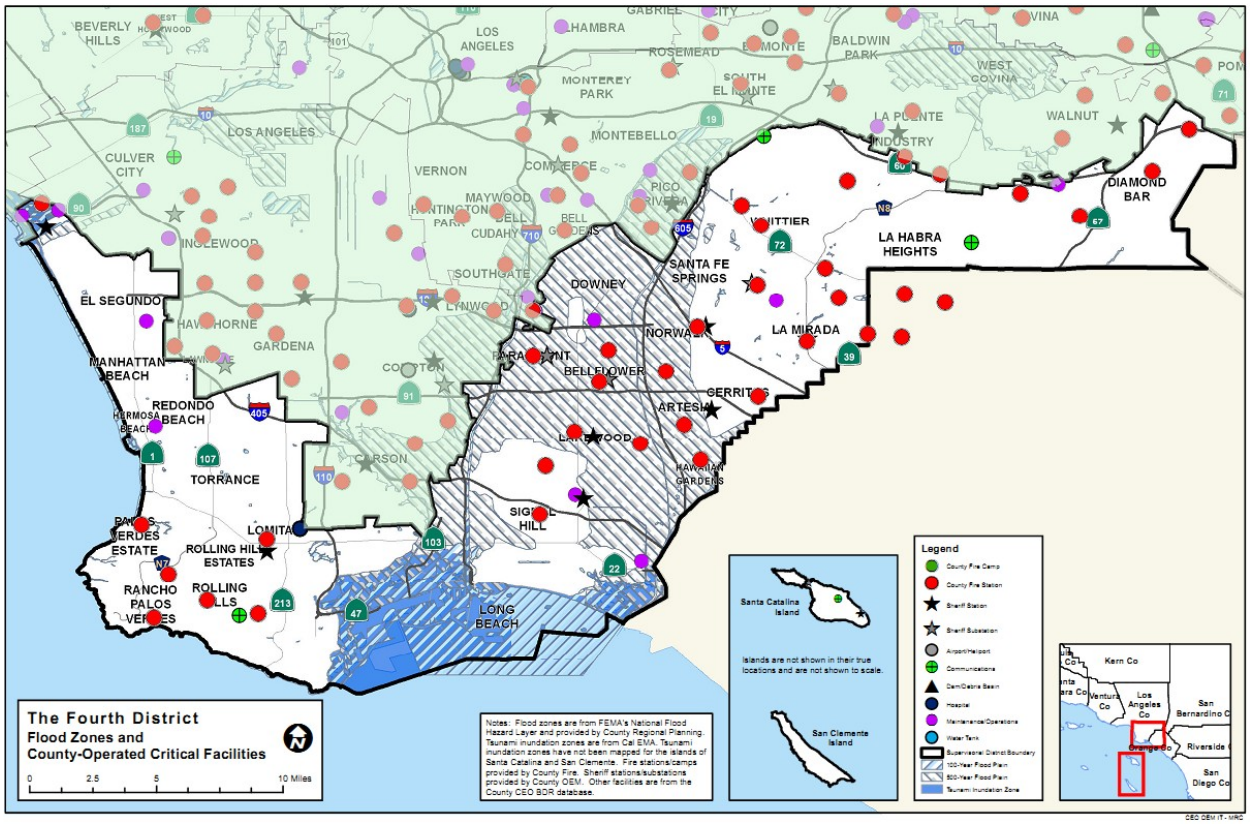
The type of property damage caused by flood events depends on the depth and velocity of the floodwaters. Faster moving floodwaters can wash buildings off their foundations and sweep cars downstream. Pipelines, bridges, and other infrastructure can be damaged when high waters combine with flood debris. Extensive damage can be caused by basement flooding and landslide damage related to soil saturation from flood events. Most flood damage is caused by water saturating materials susceptible to loss (i.e., wood, insulation, wallboard, fabric, furnishings, floor coverings, and appliances). In many cases, flood damage to homes renders them unlivable.

Flood events impact businesses by damaging property and by interrupting business. Flood events can cut off customer access to a business as well as close a business for repairs. A quick response to the needs of businesses affected by flood events can help a community maintain economic vitality in the face of flood damage. Responses to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

Publicly owned facilities are a key component of daily life for all citizens of the county. Damage to public water and sewer systems, transportation networks, flood control facilities, emergency facilities, and offices can hinder the ability of the government to deliver services. Government can take action to reduce risk to public infrastructure from flood events, as well as craft public policy that reduces risk to private property from flood events.

During natural hazard events, or any type of emergency or disaster, dependable road connections are critical for providing emergency services. Road systems in the City of Manhattan Beach are maintained by multiple jurisdictions. Federal, state, county, and city governments all have a stake in protecting roads from flood damage. Road networks often traverse floodplain and floodway areas. Transportation agencies responsible for road maintenance are typically aware of roads at risk from flooding.

Flood-related environmental quality problems could potentially include bacteria, toxins, and pollution. These conditions would need to be addressed during the response and recovery phases of disaster management.



*Note – per the CalOES MyHazards mapping tool, Manhattan Beach is in an area of low hazard of flooding.

6.3.3 Landslide

The City has only one area with land movement potential, Sand Dune Park. Historically, Manhattan Beach has had several sand dunes as typical throughout the coastal area, the sand dune at this park is the last remaining natural sand dune in the City. This sand dune, which is exceptionally high, has been converted to a public recreational use.

The General Plan identifies the north end of Sand Dune Park as being the only area in the City that may be prone to landslides due to unstable soils.

Although there are no records of past landslide events causing major property damage, it is recommended that the City continue to map and monitor landslide and debris flow areas to prevent or mitigate against future loss.

Although landslides have not posed a significant problem to the City of Manhattan Beach in the past, the hazard-prone areas should continue to be monitored and regulated.

Insert landslide hazard information here

6.3.4 Tsunami

History has shown that the probability of a tsunami in Manhattan Beach is an extremely low threat. However, if a tsunami were to occur, the consequences would be significant. The impact could cause extreme loss of life, destroy hundreds of high-priced homes, and greatly affect the City's coastal businesses and economic vitality,

including tourism. Even if all community members and visitors were safely evacuated, the damage to property in this densely populated, high-property value area would still be tremendous.

"Since 1812, the California coast has had 14 tsunamis with wave heights higher than three feet; six of these were destructive. The Channel Islands were hit by a significant tsunami in the early 1800s. The worst tsunami resulted from the 1964 Alaskan Earthquake and caused 12 deaths and at least $17 million in damages in Northern California."
(Source: http://education.sdsc.edu/optiputer/htmlLinks/california_tsunami.html)

Types of Tsunamis:

Pacific-Wide and Regional Tsunamis

Tsunamis can be categorized as "local" and Pacific-Wide. Typically, a Pacific-Wide tsunami is generated by major vertical ocean bottom movement in offshore deep trenches. A "local" tsunami can be a component of the Pacific-Wide tsunami in the area of the earthquake or a wave that is confined to the area of generation within a bay or harbor and caused by movement of the bay itself or landslides.

On December 26, 2004 the second biggest earthquake in recorded history occurred off the coast of Indonesia. The Magnitude 9.3 earthquake unleashed a devastating tsunami that traveled thousands of kilometers across the Indian Ocean, taking the lives of nearly 300,000 people in countries as far apart as Indonesia, the Maldives, Sri Lanka and Somalia. The catastrophe was one of the deadliest events in modern history.

In 1960, a large tsunami caused widespread death and destruction throughout the Pacific was generated by an earthquake located off the coast of Chile. It caused loss of life and property damage not only along the Chile coast but also in Hawaii and as far away as Japan. The Great

Alaskan Earthquake of 1964 killed 106 people and produced deadly tsunami waves in Alaska, Oregon and California.

In July 1993, a tsunami generated in the Sea of Japan killed over 120 people in Japan. Damage also occurred in Korea and Russia but spared other countries since the tsunami wave energy was confined within the Sea of Japan. The 1993 Japan Sea tsunami is known as a "regional event" since its impact was confined to a relatively small area. For people living along the northwestern coast of Japan, the tsunami waves followed the earthquake within a few minutes.

During the 1990's, destructive regional tsunamis also occurred in Nicaragua, Indonesia, the Philippines, Papua New Guinea, and Peru, killing thousands of people. Others caused property damage in Chile and Mexico.

In less than a day, tsunamis can travel from one side of the Pacific to the other. However, people living near areas where large earthquakes occur may find that the tsunami waves will reach their shores within minutes of the earthquake. For these reasons, the tsunami threat to many areas such as Alaska, the Philippines, Japan and the West Coast of the United States can be immediate (for tsunamis from nearby earthquakes which take only a few minutes to reach coastal areas) or less urgent (for tsunamis from distant earthquakes which take from three to 22 hours to reach coastal areas).

A local tsunami (confined to the area of generation within a bay or harbor and caused by movement of the bay itself or local landslides) may be the most serious threat as it strikes suddenly, sometimes before the earthquake shaking stops.

Tsunamis have been documented extensively in California since 1806. Although the majority of tsunamis have occurred in Northern California, Southern California has been impacted as well. In the 1930's, four tsunamis struck the Los Angeles County, Orange County, and San Diego County coastal areas. In Orange County the tsunami

wave reached heights of 20 feet or more above sea level. In 1964, following the Alaska Earthquake (Magnitude 8.2), tidal surges of approximately 4 feet to 5 feet hit the Huntington Harbor area causing moderate damage.

The tsunami threat to the City of Manhattan Beach is considered low, although recent studies indicate a possibility that an off-shore landslide could generate a tsunami that could threaten the coastal areas. Although the risk is considered low, the impacts would be high to the City's coastal areas. There are no critical or essential facilities located in the portion of the City most vulnerable to tsunamis. However, the El Segundo Power Plant and Chevron Refinery are located immediately adjacent to Manhattan Beach's northern boundary. The vulnerability of these facilities to threats associated with tsunami are not known.

Notification

The National Warning System (NAWAS) is an integral part of the Alaska Tsunami Warning Center. Reports of major earthquakes occurring anywhere in the Pacific Basin that may generate seismic sea waves are transmitted to the Honolulu Observatory for evaluation. An Alaska Tsunami Warning Center is also in place for public notification of earthquakes in the Pacific Basin near Alaska, Canada, and Northern California. The Observatory Staff determines action to be taken and relays warnings over the NAWAS circuits to inform and warn West Coast states. The State NAWAS circuit is used to relay the information to the Los Angeles Operational Area warning center which will in turn relay the information to local warning points in coastal areas. The same information is also transmitted to local jurisdictions over appropriate radio systems, teletype, and telephone circuits to ensure maximum dissemination.

A Tsunami Watch Bulletin is issued if an earthquake has occurred in the Pacific Basin and could cause a tsunami. A Tsunami Warning Bulletin is issued when an earthquake has occurred and a tsunami is spreading across the Pacific Ocean. When a threat no longer exists, a Cancellation Bulletin is issued.

Local Tsunamis

Add description of local tsunamis here

Insert Tsunami inundation map here.

Significantly more information will be added here on tsunamis and their impact on Manhattan Beach.

6.3.5 Climate Change

Insert climate change hazard information here

6.3.6 Adverse Weather

Insert adverse weather hazard information here

7.0 Mitigation Goals

The LHMP goals describe the overall direction that City of Manhattan Beach can take to work toward mitigating risk from hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations outlined in the action items.

Overarching LHMP goals include the protection of life and property, enhancing public awareness of the risks associated with known hazards, protecting natural systems, encouraging partnerships across the community, strengthening emergency services, and encouraging public participation in the hazard mitigation and disaster preparedness.

7.1 Mitigation Actions

For this section, we will re-evaluate and confirm the row headings, and will work with departments and personnel to identify additional action items that can be taken and added to the matrix, as well as in section VI – Hazard Mitigation Strategy. Everything currently in the table has been approved by Chief Hafdell and Chief Chiella, and they want them to stay. I would suggest that we take the FEMA document "Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards" and go over it with representatives from Community Development (Building and Safety, Planning and Zoning), and Public Works. Have them take a look at the ideas in the document, and also ask them if they have additional suggestions for other projects that be included in this plan.

Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
			Protect Life and Property	Public Awareness	Natural Systems	Partnerships and	Emergency Services
MH-1 Integrate goals/action items into General Plan, Municipal Code, Capital Improvement Plan and other regulatory or policy documents and programs, as appropriate.	Public Works (PW), Community Development (ComDev)	CIP – 2008 Annually	X	X	X	X	X
MH-2 Identify and pursue funding opportunities to develop and implement local hazard mitigation activities.	Fire, PW	Ongoing annually	X		X	X	X

MH-3 Retrofit essential city buildings with automatic fire sprinkler systems to limit damage from fires caused by earthquakes and other natural disasters.	Fire, PW	Ongoing	X	X			X
MH-4 Develop inventories of critical facilities and infrastructure, assess structural vulnerability to the identified hazards and prioritize mitigation projects.	Fire, Police, PW	Ongoing	X				X
MH-5 Strengthen emergency services preparedness and response by coordinating emergency services with natural hazard mitigation programs and enhancing public education on a regional scale.	Fire, Police	Ongoing				X	X
MH-6 Develop, enhance and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.	Fire, Police, PW	Ongoing		X			
MH-7 Evaluate current hazard warning systems to ensure effectiveness and efficiently increase coordination between local jurisdictions and emergency service providers.	Fire, Police	Ongoing				X	X
MH-8 Update policy for government to determine what reconstruction criteria should be applied to structures damaged during a disaster. Update building and reconstruction policies and requirement in the local government building code for post-disaster situations.	Building & Safety	Ongoing	X				
MH-9 Continuously review priorities and publish for restoration of the community's infrastructure and vital public facilities following a disaster.	PW	Ongoing	X				X

MH-10 Regularly update information on MB website that includes information specific to residents, building codes, and information on damage prevention. Continue to encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices. E.g. How to secure a bookcase; How to make a family notification and evacuation plan.	Building & Safety	Ongoing		X			
MH-11 Provide a program to minimize the impact on utilities based on all possible disasters (may require redundant or quick-replacement systems).	Engineering	Ongoing	X				
MH-12 Inspect fire hydrants and conduct fire- flow tests on a regular basis.	Fire, PW	Ongoing annually	X				X
MH-13 Incorporate the Los Angeles Regional Uniform Codes Program into the City's Municipal Code, making the Municipal Code building regulations more stringent than the current adopted state codes. To be implemented on an on-going basis.	Building & Safety	Ongoing, most recently completed in 2013	X			X	X
MH-14 Continue participation in local mutual aid agreements for emergency response with other jurisdictions.	Fire, Police, PW	Ongoing				X	X
MH-15 Ensure availability/effective response of emergency and disaster relief services for the community after a	Fire	Ongoing	X	X		X	X

MH-16 Implement and coordinate existing local, state and federal disaster preparedness resources and emergency mobilization/evacuation plans to	Fire	Ongoing	X	X		X	X
MH-17 Work with the Manhattan Beach Unified School District (MBUSD) in teaching children to respond appropriately in emergency and to threats to	Fire	Ongoing	X	X		X	X
MH-18 Continue to operate NIXEL, which provides immediate notification to residents when a disaster strikes.	Fire	Ongoing	X	X			X
MH-19 Alert residents to dangers that household items can pose during a natural hazard/disaster. The following are measures homeowners can take: repair electrical wiring and leaky gas connections, secure shelving, move heavy/large objects to lower shelves, hang pictures and mirrors away from beds, brace overhead light fixtures, secure water heater, air foundation/ceiling cracks, store	Fire, Building & Safety, Police	Ongoing	X	X	X		
MH-20 Adopt effective land-use regulations and building codes and continue to discourage new construction or development in identified hazard areas without first implementing appropriate remedial measures.	ComDev, Building & Safety	Building Codes Adopted 2008 General Plan 2003	X	X		X	
EQ-1 City reservoirs and the elevated water tank have been evaluated and seismically retrofitted.	PW	Ongoing annually	X				
EQ-3 Identify and require analysis and modification, as needed, of structures that may fall into categories that are vulnerable to damage from earthquakes, such as pre-cast concrete, soft-story structures, and non-ductile concrete frame buildings.	Building & Safety	Ongoing	X	X		X	

EQ-4 Continue to adopt new building codes and design standards that reflect new seismic requirements.	Building & Safety	Ongoing	X	X		X	X
EQ-5 Continually maintain, monitor, and update all relevant geologic and seismic related ordinances, regulations, and codes, to maximize awareness and planning for emergency response efforts.	Building & Safety	Ongoing	X	X		X	X
EQ-6 Inform the public about earthquake safety, hazards and risks which may include: City newsletters & website, cable TV, Reverse 911 or other communication methods that explain the City's Emergency Response Plan, Emergency Operations Center, and appropriate procedures and phone numbers to call if a disaster occurs.	Fire	Ongoing	X	X		X	X
EQ-7 Promote the collection of relevant data on local groundwater levels and areas susceptible to liquefaction, as a basis for future refinements of liquefaction policies or procedures in the City.	ComDev	Completed, and included in the General Plan	X	X			
EQ-8 Support the improved delineation of potential liquefaction zones and strengthen the justification for geotechnical site investigations.	ComDev	Completed, and included in the General Plan	X	X			
EQ-9 Support the development of methods to quantify ground deformation associated with the occurrence of liquefaction.	ComDev	Completed, and included in the General Plan	X		X		

FLD-1 Continue working with Los Angeles County to increase storm drain capacity and efficiency.	PW	Ongoing	X		X	X	X
FLD-2 Continue to pursue all capital improvement projects related to improvement, maintenance for water related infrastructure.	PW	Ongoing	X		X		
FLD-3 Prepare an inventory of major urban drainage problems, and identify causes and potential mitigation measures for urban drainage problem areas.	PW	Completed Comm. Safety Element of General Plan 2003. Update in next General Plan	X	X	X	X	X
FLD-5 Review proposed development and require retention basins, where necessary, to reduce flooding risks. Ensure critical facilities have proper storm water drainage to prevent local flooding.	PW	Ongoing	X	X	X	X	X
FLD-6 Encourage green building practices to increase permeable surfaces.	ComDev	Ongoing		X	X	X	
LND-1 Consider Installation of signs warning the public of landslide danger in the vicinity of Sand Dune Park.	PW	2016	X	X			X

LND-2 Erosion control maintenance at Sand Dune Park.	PW	Ongoing	X				
TSU-1 Initiate a tsunami awareness program. Provide education to those specifically living or working within the areas of Manhattan Beach at risk of tsunami inundation. Publish tsunami information and post on the City's website for general dissemination.	Fire, Police	Ongoing	X	X			X
TSU-2 Consider Installation of signs along the coast directing people away from the ocean to flee a tsunami.	PW	2017	X	X			X
TSU-3 Investigate a local tsunami warning system that would utilize sirens from fire and police department's equipment.	Fire, Police, PW	Warning system developed, updates ongoing	X	X			X
TSU-4 Develop Tsunami Warning Plan to establish improved communications between with local agencies and universities.	Fire, Police	Plan developed, updates ongoing	X	X		X	
TSU-5 Study feasibility of a warning system for "local tsunami" caused by close-to-shore underwater landslides.	Fire, Police		X	X		X	

8.0 Plan Adoption

The City Council will adopt the City of Manhattan Beach Natural Hazard Mitigation Plan. Following adoption, the Hazard Mitigation Advisory Committee will take responsibility for plan implementation. The City Manager (or designee) will serve as a convener to facilitate the Hazard Mitigation Advisory Committee meetings, and will assign tasks such as updating and presenting the Plan to the members of the Committee. Plan implementation and evaluation will be a shared responsibility among all of the Hazard Mitigation Advisory Committee members.

Manhattan Beach addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and City Building and Safety Codes. The LHMP provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City of Manhattan Beach will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

The City of Manhattan Beach Building & Safety Division is responsible for adhering to the State of California's Building & Safety Codes, and local amendments. Additionally, the Hazard Mitigation Advisory Committee will work with other agencies at the state level to review, develop and ensure Building & Safety Codes that are adequate to mitigate or present damage by natural hazards. This is to ensure that life-safety criteria are met for new construction.

The majority of the goals and action items in the Mitigation Plan may be achieved through activities recommended in the City's Capital Improvement Plans (CIP). The Public Works Department develops the CIP and reviews it on an annual basis. Upon annual review of the CIP, the Hazard Mitigation Advisory Committee will identify areas that the Natural Hazards Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

Within six months of formal adoption of the mitigation plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms at the City level. The meetings of the Hazard Mitigation Advisory Committee will provide an opportunity for Committee members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

8.1 Project Prioritization

Throughout the development of the Manhattan Beach LHMP, the Planning Committee regularly evaluated the merits of proposed mitigation activities. Considerations in determining prioritization included, but were not limited to, a project's feasibility, scope of impact, economic considerations, and potential level of support from the community. Planning Committee members also met with City department representatives in order to more thoroughly assess the prioritization of projects and action items. Mitigation goals and action items were also prioritized to address Manhattan Beach's greatest threats. Significantly more language will be added here.

8.2 Cost/Benefit Analysis

For the purposes of this project, the Planning Committee used a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Planning Committee will use other approaches to understand the cost and benefits of each action item and develop a prioritized list.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.
The following section will be evaluated for relevance and edited for brevity

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

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

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

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

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

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

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

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

8.3 Benefit/Cost Analysis

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

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

8.4 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. Hence, economic analysis approaches are covered for both public and private sectors as follows.

8.5 Investing in public sector mitigation activities

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

8.6 Investing in private sector mitigation activities

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

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

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

How Can an Economic Analysis be Conducted?

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

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

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

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

- Estimate the benefits. Projecting the benefits or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.

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

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

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

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

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

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

How are Benefits of Mitigation Calculated?

8.7 Economic Returns of Natural Hazard Mitigation

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

- Building damages avoided
- Content damages avoided
- Inventory damages avoided

- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

8.8 Additional Costs from Natural Hazards

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

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

8.9 Additional Considerations

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

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds,

environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation

8.10 Integrating With the Planning Mechanism

8.11 Updating the Mitigation Strategy

8.12 Communicating the Mitigation Action Plan

9.0 Plan Maintenance

The Plan Maintenance section of this document details the formal process that will ensure that the City of Manhattan Beach Hazard Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually, and producing a plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the City of Manhattan Beach 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.

The City of Manhattan Beach Natural Hazards Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The convener or designee will be responsible for contacting the Hazard Mitigation Advisory Committee members and organizing the annual meeting.

Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The Committee will review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Committee will also review the Risk Assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The department (coordinating organization) responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The Hazard Mitigation Advisory Committee will also notify all holders of the City plan when changes have been made. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer for review and the Federal Emergency Management Agency for approval.

9.1 Record of Revisions

Record all corrections and updates made to this plan on this page. All changes made should be transmitted to and approved by the City's acting Emergency Services Coordinator. The Emergency Services Coordinator will maintain the official copy of the Local Hazards Mitigation Plan.

Date	Section	Pages	Changes Made	Name and Title

9.2 Plan Review and Adoption
9.3 Local Plan Review
9.4 City Council Approval and Adoption
9.5 State and FEMA Review

10.0 Challenges in Achieving Mitigation Goals

10.1 Funding and Assistance

10.2 Conclusion