



**CITY OF SOUTH PASADENA  
PUBLIC SAFETY COMMISSION REGULAR MEETING AGENDA**

**CITY COUNCIL CHAMBERS  
1424 MISSION STREET, SOUTH PASADENA, CA 91030  
IN-PERSON**

**Monday, August 14, 2023 at 8:30 a.m.**

**South Pasadena Public Safety Commission Statement of Civility**

*As your appointed governing board, we will treat each other, members of the public, and city employees with patience, civility and courtesy as a model of the same behavior we wish to reflect in South Pasadena for the conduct of all city business and community participation. The decisions made today will be for the benefit of the South Pasadena community and not for personal gain.*

**NOTICE ON PUBLIC PARTICIPATION & ACCESSIBILITY**

The South Pasadena Public Safety Commission Meeting will be conducted in-person from the Council Chambers, Amedee O. "Dick" Richards, Jr., located at 1424 Mission Street, South Pasadena.

The Public Safety Commission Meeting for **August 14, 2023** will be broadcasted via zoom teleconference and will take place in-person.

To maximize public safety, members of the public may attend and/or participate by the following means:

The Meeting will be available:

- In-person: 1424 Mission Street, South Pasadena, CA 91030
- Via Zoom – **Meeting ID: 841 9322 6718**
- Zoom Link – <https://us06web.zoom.us/j/84193226718>

To maximize public safety while still maintaining transparency and public access, members of the public can observe the meeting via Zoom in one of the methods below:

1. Go to the Zoom website, <https://zoom.us/join> and enter the Zoom Meeting information; or
2. Click on the following unique Zoom Meeting link: <https://us06web.zoom.us/j/84193226718>
3. You may listen to the meeting by calling: +1-669-900-6833 and entering the Zoom Meeting ID

For additional Zoom assistance with telephone audio, you may find your local number at:

<https://zoom.us/u/aiXV0TAW2>

**CALL TO ORDER**

**ROLL CALL**

Commissioners Tricia Desmarais, Armando Munoz, Walter Cervantes, Bethesda Gee, Amin Alsarraf, Vice Chair Lisa Watson, Chair Ed Donnelly

**COUNCIL LIAISON:**

Councilmember Michael Cacciotti

## **PUBLIC COMMENT AND SUGGESTIONS**

The City Council welcomes public input. If you would like to comment on an agenda item, members of the public may participate **by means of one of the following options:**

Option 1:

Participants will be able to “raise their hand” using the Zoom icon during the meeting, and they will have their microphone un-muted during comment portions of the agenda to speak for up to 3 minutes per item.

Option 2:

Email public comment(s) to [pscpubliccomment@southpasadenaca.gov](mailto:pscpubliccomment@southpasadenaca.gov).

Public Comments received in writing will not be read aloud at the meeting, but will be part of the meeting record. There is no word limit on emailed Public Comment(s). Please make sure to indicate:

- 1) Agenda item you are submitting public comment on.
- 2) Submit by no later than 6:00pm April 9, 2023.

*NOTE: Pursuant to State law, the Commission may not discuss or take action on issues not on the meeting agenda, except that members of the Commission or staff may briefly respond to statements made or questions posed by persons exercising public testimony rights (Government Code Section 54954.2). Staff may be asked to follow up on such items.*

### **1. Public Comment**

## **ACTION/DISCUSSION**

### **2. Minutes of the Public Safety Commission Special Meeting of June 5, 2023**

Consideration of the minutes of the Public Safety Commission Special Meeting of June 5, 2023.

### **3. Update on Draft Local Hazard Mitigation Plan for the City of South Pasadena for Submission and Approval by California State Office of Emergency Services and the Federal Emergency Management Agency**

Request for Commissioner input on the City’s draft Local Hazard Mitigation Plan.

## **INFORMATION REPORTS**

No items.

## **COMMUNICATIONS**

### **4. City Council Liaison Communications**

### **5. Staff Liaison Communications**

### **8. Commissioner Communications**

## **ADJOURNMENT**

**PUBLIC ACCESS TO AGENDA DOCUMENTS**

The complete agenda packet may be viewed on the City's website, [www.southpasadenaca.gov](http://www.southpasadenaca.gov).

Meeting recordings will be available for public viewing after the meeting. Recordings will be uploaded to the City's YouTube Channel no later than the next business day after the meeting. The City's YouTube Channel may be accessed at: [https://www.youtube.com/channel/UCnR169ohzi1AlewD\\_6sfwDA/featured](https://www.youtube.com/channel/UCnR169ohzi1AlewD_6sfwDA/featured)

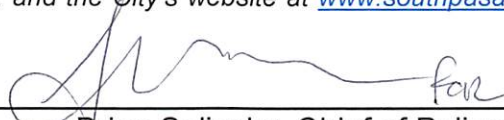
**ACCOMMODATIONS**

The City of South Pasadena wishes to make all of its public meetings accessible to the public. If special assistance is needed to participate in this meeting, please contact the City Clerk's Division via e-mail at [CityClerk@southpasadenaca.gov](mailto:CityClerk@southpasadenaca.gov) or by calling (626) 403-7230. Upon request, this agenda will be made available in appropriate alternative formats to persons with disabilities. Notification at least 48 hours prior to the meeting will assist staff in assuring that reasonable arrangements can be made to provide accessibility to the meeting (28 CFR 35.102-35.104 ADA Title II).

*I declare under penalty of perjury that I posted this notice of agenda on the bulletin board in the courtyard of City Hall at 1414 Mission Street, South Pasadena, CA, and the City's website at [www.southpasadenaca.gov](http://www.southpasadenaca.gov) on August 10, 2023 as required by law.*

August 10, 2023

Date



Brian Solinsky, Chief of Police



**CITY OF SOUTH PASADENA**  
VIA HYBRID / IN-PERSON  
CITY COUNCIL CHAMBERS  
1424 MISSION STREET, SOUTH PASADENA, CA 91030

**PUBLIC SAFETY COMMISSIONS SPECIAL MEETING MINUTES**

Monday, June 5, 2023 at 6:30 p.m.

**CALL TO ORDER**

Date/Time: June 5, 2023 / 6:41 p.m.

**ROLL CALL**

Commissioners Present: Commissioners Desmarais, Munoz, Cervantes, Gee, Vice Chair Watson, Chair Donnelly

Commissioners Absent: Commissioner Alsarraf

Officials Present: Police Chief Brian Solinsky, Fire Chief Paul Riddle, Councilmember Michael Cacciotti, Management Analyst Alison Wehrle, and Police Clerk Nelly Ochoa

Officials Absent: None

**PUBLIC COMMENTS AND SUGGESTIONS**

1. **Public Comment:** None

**ACTION/DISCUSSION**

2. **Minutes of the Public Safety Commission Regular Meeting of April 10, 2023**

Motion: MOTION BY COMMISSIONER CERVANTES AND SECOND BY VICE CHAIR WATSON, CARRIED 6-0, to approve the Minutes of the April 10, 2023 Public Safety Commission Regular Meeting as presented.

Ayes: Commissioners Desmarais, Munoz, Cervantes, Gee, Vice Chair Watson, Chair Donnelly

Noes: None

Abstain: None

3. **Police Department Assessment**

Raftelis Consultants Rebekka Hosken and Cassandra Deck-Brown provided a presentation and hosted a discussion on the assessment underway to review Police Department staffing and operations analysis as part of the public engagement portion of the project. A variety of questions were considered to successfully access the needs of



South Pasadena and the City's community members. The Consultants gave a brief presentation on project findings to this point, including community characteristics and expectations, strengths, and challenges. The Consultants opened up a forum-style discussion which included five prompts related to public safety for the community to respond to, both in person and online. Consultant Hosken ended the presentation with an overview on the timeline and next steps for the project, and welcomed the community to complete the project survey.

*Public Comment was provided throughout the meeting, and included Yvonne LaRose, Julie Harris, Bill Kelly, Helen Tran, Ella Hushagen, Victoria Patterson, Laboni Hoq, and others.*

## **INFORMATION REPORTS**

No items.

## **COMMUNICATIONS**

### **4. City Council Liaison Communications**

Councilmember Cacciotti spoke about the homeless outreach program and efforts to get others to participate. He mentioned how other cities were also interested in picking up the same motto for their communities.

### **5. Staff Liaison Communications**

No items.

### **6. Commissioner Communications**

The Commissioners expressed appreciation for community members participating in the meeting.

## **ADJOURNMENT**

Date/Time: June 5, 2023 / 8:24 p.m.

Respectfully Submitted:

Approved By:

---

Nelly Ochoa  
Recording Secretary

---

Ed Donnelly  
Chair



# Public Safety Commission Agenda Report

ITEM NO. 3

**DATE:** August 14, 2023

**FROM:** Paul Riddle, Fire Chief

**SUBJECT:** **Update on Draft Local Hazard Mitigation Plan for the City of South Pasadena for Submission to and Approval by California State Office of Emergency Services and the Federal Emergency Management Agency**

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## **Recommendation**

It is recommended that the Public Safety Commission, after receiving an update on the draft Local Hazard Mitigation Plan (LHMP), provide input on the document.

## **Executive Summary**

Hazard mitigation planning reduces the risk to people and property, and reduces the cost of recovering from a disaster. One step in effective hazard mitigation is having an updated LHMP which identifies the hazards that are specific to the community as well as identifying appropriate mitigation actions. Federal guidelines require LHMPs be updated and adopted by local governing authorities every five years. The City's LHMP was initially developed in 2005 and updated in 2012 and 2018. Staff initiated the 2023 update of the LHMP on May 4, 2022 and the City is on schedule to seek approval and adoption of the updated LHMP and meet FEMA's five year requirement.

## **Background**

The City has contracted with a consultant, R.E. Patterson, to update the LHMP. The consultant developed the City's previous LHMP and presented to the City Council on September 18, 2019 for approval at that time. The consultant will present the 2023 draft LHMP to the City Council on August 16, 2023 to receive feedback and seek approval of the draft LHMP. After receiving City Council approval, the draft LHMP will be sent to Cal OES and FEMA for final review. Upon receiving final review from Cal OES and FEMA, the draft LHMP will be brought back before the City Council for final adoption via a City Resolution.

According to the FEMA, the purpose of mitigation planning is to identify policies and actions that can be implemented to reduce risk and future losses from disasters. Mitigation plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage and subsequent reconstruction. The planning process is as important as the plan itself and involves community stakeholders. The plan creates a framework for risk-based decision making to reduce damages to the community, economy and potential threat to lives.

Following the Hurricane Katrina disaster in the Gulf of Mexico in 2005, FEMA mandated that state and local governments create and formally adopt federally approved LHMPs. These plans are designed to prompt local governments to identify possible natural and man-made disasters and to provide mitigation steps. Although some disasters may be impossible to predict and/or avoid, steps should still be taken to lessen the impacts of a disaster. Hurricane Katrina shed light on areas that required a greater depth of focus for planning and preparedness in all communities.

### **Analysis**

State and local governments must prepare and adopt FEMA approved LHMPs in order to comply with federal requirements. Federal guidelines require LHMPs be updated and adopted by local governing authorities every five years.

LHMP adoption requires stakeholder involvement and a planning process that takes place over the course of a year. City commissions and stakeholders have reviewed the draft LHMP, provided input, and approved the current draft LHMP. Presentations were provided to the following commissions and stakeholders as follows:

- June 9, 2022 Initial Technical Advisory Committee (TAC) Meeting - The TAC's first meeting was held in-person. This meeting focused on identifying the hazards facing the City; a discussion on how to set goals, objectives, and mitigation actions; and establishing the Public Advisory Committee (PAC). The meeting agenda packet is included in Appendix 1 of the Plan.
- August 8, 2022 Public Safety Commission – A presentation was provided to the PSC regarding emergency preparedness. The presentation provided updates on both the updating of the City's Emergency Operations Plan (EOP) as well as the LHMP.
- September 12, 2022 Public Safety Commission – An additional update was provided to the PSC regarding the LHMP and EOP and feedback was received.
- October 1, 2022 Second TAC Meeting - The second TAC meeting was held virtually via Zoom. During the meeting, the TAC reviewed the list of City facilities, identified the hazards facing the City, identified members for the PAC, and the development of goals, objectives, and mitigation actions. The meeting agenda packet is included in Appendix 1 of the Plan.
- November 14, 2022 Third TAC Meeting - The third TAC meeting was held via Zoom to review the initial draft LHMP based on information developed from the first two TAC meetings.
- February 23, 2023 Initial PAC Meeting - The first PAC meeting was held via Zoom. The meeting focused on a presentation regarding LHMPs and their purpose, the role of the PAC, a review of the hazards identified by the TAC, and the initial development of the Plan's goals, objectives, and mitigation actions. A copy of the draft LHMP was sent to the PAC.

- April 11, 2023 Planning Commission Meeting (Public Hearing) – Prior to the meeting, the Public Hearing was noticed in the South Pasadena Review newspaper and on the City’s website. At the meeting, the Commission received a presentation on the LHMP and the associated planning process. Following the Public Hearing (In-Person & Zoom), the Commission passed a Resolution approving the LHMP and recommended it be sent it to the City Council for approval.
- May 15, 2023 Second TAC Meeting - The second PAC meeting was held via Zoom. The meeting focused on gathering feedback from public stakeholders and allied agency partners.
- May 24, 2023, a press release was posted in inviting them to view the draft LHMP on the City’s website.

### **Alternatives**

In order to be eligible for Hazard Mitigation Grants and Disaster Assistancess Grants and funding the City must comply with the update process and schedule. If the LHMP is not approved and submitted the City could be financially impacted. Therefore, no alternatives are suggested.

### **Key Performance Indicators and Strategic Plan**

This item is in line with section 3(c) of the City’s adopted 2021-2026 Strategic Plan, which identifies updating the City’s LHMP and Emergency Operations Plan as required by federal and state regulations.

### **Attachments:**

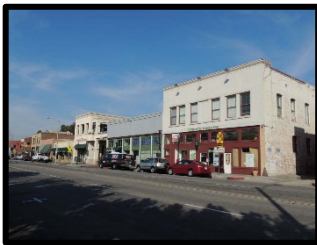
1. Draft 2023 LHMP

**Attachment 1**

Draft 2023 LHMP



# City of South Pasadena Local Hazard Mitigation Plan 2023 - 2028



1414 Mission Street  
South Pasadena, CA 91030  
(626) 403-7200







# City of South Pasadena Local Hazard Mitigation Plan 2023 - 2028

*Prepared by*

*R.E. PATTERSON AND ASSOCIATES*  
*EMERGENCY MANAGEMENT PLANNING & TRAINING*

131 Loma Linda Court  
Scotts Valley, CA 95066  
(831) 438-3290  
[repattersonandassociates.com](http://repattersonandassociates.com)

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**INSERT A COPY OF THE BOARD RESOLUTION IN THE FINAL DOCUMENT**

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## Section One - Introduction

The City of South Pasadena offers the benefits of living in a Mediterranean type of climate. The city is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disaster situations.

Natural hazards and extreme weather events are an ongoing part of the weather cycle and seasons. However, when natural hazards such as earthquakes, fires, or winter storms are at their height, they pose a severe risk to people and property. They can cause death, leave people injured or displaced, cause significant damage to our communities, businesses, public infrastructure, and environment, cost tremendous amounts in response and recovery dollars, and contribute to economic loss.

Throughout history, the residents of the City of South Pasadena have dealt with the various hazards affecting the area. In the past, the area's residents dealt with earthquakes, earth movements, flooding, wildfire, and severe storms.

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

A successful hazard mitigation strategy enables the implementation and sustaining of local actions that reduce vulnerability and risk from hazards or the severity of the effects of hazards on people and property. Historically, in many local jurisdictions, disasters are followed by repairs and reconstruction, restoring the area to pre-disaster conditions.

While we cannot prevent disasters from happening, their effects can be reduced or eliminated through a well-organized public education and awareness effort, preparedness activities, and mitigation actions. For those hazards which cannot be fully mitigated, the community must be prepared to provide an efficient and effective response and recovery. The City of South Pasadena has the Raymond Earthquake Fault running through it, experiences severe winter storms, and is subject to various other natural disasters. This Hazard Mitigation Plan (Plan) outlines opportunities to increase South Pasadena's resiliency in the face of future natural hazards.

### 1.1 PURPOSE OF THE PLAN

As the cost of damages from natural disasters continues to increase, the City of South Pasadena understands the importance of identifying effective ways to reduce vulnerability to disasters. This Plan assists South Pasadena in reducing vulnerability to disasters by identifying critical facilities (**Table 12 - South Pasadena Critical Facilities**), resources, information, and strategies for risk reduction while helping to guide and coordinate mitigation actions.

The Plan provides a set of strategies intended to do the following: reduce risk from natural hazards through education and outreach programs, foster the development of partnerships, and implement risk reduction activities.



The resources and information within the Plan:

- Establish a basis for coordination and collaboration among participating agencies and public entities;
- Identify and prioritize future mitigation projects; and
- Assist in meeting the requirements of federal assistance programs. The South Pasadena Hazard Mitigation Plan works in conjunction with other plans, including the General Plan, the Strategic Plan, and the City’s Emergency Operations Plan.

## **1.2 AUTHORITY**

The Disaster Mitigation Act of 2000 (DMA 2000), Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, risks, and vulnerabilities, identifies and prioritizes mitigation actions, encourages the development of local mitigation and provides technical support for those efforts. This mitigation plan serves to meet these requirements. This plan was developed following the guidelines set forth in FEMA’s *Local Mitigation Planning Guide* (FP 206-21-002), April 19, 2023.

## **1.3 PLAN ADOPTION**

The City of South Pasadena approved the LHMP on August 16, 2023. After the California Office of Emergency Services (CalOES) review, it was approved by FEMA on **Date**. The City Council adopted the Final LHMP on **Date**.

## **1.4 PLAN USE**

Each section of the mitigation plan provides information and resources to assist the public in understanding the hazard-related issues facing residents, businesses, and the environment. The plan's structure enables the public to use a section of interest and allows the City to review and update sections when new data is available. The ability to update individual sections of the mitigation plan places less of a financial burden on the City. Decision-makers can allocate funding and staff resources to selected pieces needing review, avoiding a full update, which can be costly and time-consuming. In addition, incorporating new data into the plan will result in a hazard mitigation plan that remains current and relevant to the City.

The Local Hazard Mitigation Plan is comprised of the following sections:

### **Section One: Introduction**

The Introduction describes the background and purpose of developing the mitigation plan, introducing the mitigation priorities, and summarizing the planning process.

### **Section Two: Community Profile**

The Community Profile presents the City of South Pasadena's history, geography, demographics, and socioeconomics. It serves as a tool to provide a historical perspective of natural hazards in the city.



**Section Three: Risk Assessment and Hazard Identification**

This section provides information on hazard identification, hazard profiles, vulnerability and risk associated with natural hazards, and a vulnerability assessment of critical facilities concerning the identified hazards.

**Section Four: Hazards Affecting the City**

This section documents in-depth profiles of each of the hazards identified as having a potential impact on the City of South Pasadena.

**Section Five: Mitigation Actions**

This section provides strategies and mitigation actions to reduce potential risks to the City’s facilities.

**Section Six: Plan Maintenance Process**

This section provides information on plan implementation, monitoring, and evaluation of the assets and capabilities available to achieve the proposed mitigation actions outlined in **Section Five** and opportunities for continued public involvement.

**Section Seven: Glossary of Acronyms**

Listing of commonly used Acronyms in Emergency Management and Hazard Mitigation planning.

**1.5 MITIGATION PRIORITIES AND GOALS**

The mission of the South Pasadena Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural 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 toward building a safer, more sustainable community.

The City’s Technical Advisory Committee (TAC) has adopted the four primary goals for reducing disaster risk in the South Pasadena Hazard Mitigation Plan, which include:

1. Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.
2. Increase the ability of the city government to serve the community during and after hazard events.
3. Protect South Pasadena’s unique character, scenic beauty, and values from being compromised by hazard events.
4. Encourage mitigation activities to increase the disaster resilience of the city, institutions, private companies, and systems essential to a functioning City of South Pasadena.



**DRAFT CITY OF SOUTH PASADENA DRAFT  
LOCAL HAZARD MITIGATION PLAN**

**SECTION ONE**

**1.6 HAZARD MITIGATION PLANNING PROCESS**

City staff responsible for developing and maintaining this plan are known as the Technical Advisory Committee (TAC). Members of this team involved in the drafting of this document starting in June 2022:

**Table 1 - Technical Advisory Team Members**

Name	Title
Alma Medina	Senior Management Analyst
Andrew Jared	City Attorney
Andy Dubois	Police Sergeant
Anteneh Tesfaye	Deputy Director of Public Works
Cathy Billings	Library Director
Eric Zanteson	Fire Division Chief
Matt Chang	Planning Manager
Sheila Pautsch	Community Services Director
Somin Kang	Accountant
Tamara Binns	Assistant to the City Manager

The TAC is responsible for developing, implementing, and maintaining this plan. A Public Advisory Committee (PAC) was formed to advise the City during the development of this plan. Coordination with the PAC enables ongoing risk reduction coordination throughout the area. **Table 2** lists PAC representatives from the following local agencies:

**Table 2 - Public Advisory Committee Participants**

Committee Participants		
Name	Agency	E-Mail
Jeannette Soriano	So Cal Edison	jeannette.soriano@sce.com
Hellen Romero Shaw	Southern California Gas	HShaw@socalgas.com
Richard Gomez	Southern California Gas	RGomez@socalgas.com
Ed Chen	Athens Waste	EChen@athensservices.com
Loni Ezell	LA County DPW	lezell@dpw.lacounty.gov
Soraya Sutherlin	Area C DMAC	areac@dmac.ca.gov
Leslie Luke	LA County OEM	lluke@ceooem.lacounty.gov
Moniek Pointer	Metro	PointerMo@metro.net
Ryan Chan	American Red Cross	Ryan.chan2@Redcross.org
Dave Lubs	SPUSD	dlubs@spusd.net
Laurie Wheeler	Chamber of Commerce	laurie@southpasadena.net
Casey Law	Natural Resource & Environmental Comm.	caseylaw@caltech.edu



**DRAFT CITY OF SOUTH PASADENA DRAFT  
LOCAL HAZARD MITIGATION PLAN**

**SECTION ONE**

**Table 3 - Meeting Summaries and Public Involvement Opportunities**

Date	Purpose
<b>June 9, 2022</b>	<b>Initial TAC Meeting</b> - The Technical Advisory Committee's (TAC) first meeting was held in-person. This meeting focused on identifying the hazards facing the City; a discussion on how to set goals, objectives, and mitigation actions; and establishing the Public Advisory Committee (PAC). The meeting agenda packet is included in Appendix 1.
<b>August 8, 2022</b>	<b>Public Safety Commission</b> - An update on the LHMP process was provided to the PSC by the Fire Chief at their regularly scheduled monthly meeting.
<b>September 12, 2022</b>	<b>Public Safety Commission</b> - An additional update on the LHMP was given to the PSC at their regularly scheduled monthly meeting.
<b>October 1, 2022</b>	<b>Second TAC Meeting</b> - The second TAC meeting was held virtually via Zoom. During the meeting, the TAC reviewed the list of City facilities, identified the hazards facing the City, identified members for the Public Advisory Committee (PAC), and the development of goals, objectives, and mitigation actions. The meeting agenda packet is included in Appendix 1.
<b>November 14, 2022</b>	<b>Third TAC Meeting</b> - The third TAC meeting was held via Zoom to review the initial draft LHMP based on information developed from the first two TAC meetings.
<b>February 23, 2023</b>	<b>Initial PAC Meeting</b> - The first PAC meeting was held via Zoom. The meeting focused on a presentation regarding LHMPs and their purpose, the role of the PAC, a review of the hazards identified by the TAC, and the initial development of the Plan's goals, objectives, and mitigation actions. A copy of the draft LHMP was sent to the PAC.
<b>April 11, 2023</b>	<b>Planning Commission Meeting (Public Hearing)</b> – Prior to the meeting, the Public Hearing was noticed in the South Pasadena Outlook newspaper and on the City's website. At the meeting, the Commission received a presentation on the LHMP and the associated planning process. Following the Public Hearing (In-Person & Zoom), the Commission passed a Resolution approving the LHMP and recommended it be sent it to the City Council for approval.
<b>May 17, 2023</b>	<b>Second PAC Meeting</b> - The PAC met via Zoom for the second time to review the draft LHMP and make final recommendations to the City. Refer to <b>Table 5 - Summary of Public Comments</b> .
<b>May 24, 2023 to July 15, 2023</b>	<b>Public Outreach</b> - Upon completion of the Draft LHMP, the City posted the document on the City's website. A news release was also distributed to local media organizations regarding the posting on the website and asking for public review and comment. Refer to <b>Table 5 - Summary of Public Comments</b> .
<b>August 16, 2023</b>	<b>City Council Meeting (Public Hearing)</b> - The Public Hearing was noticed on the City's website. The Council opened a Public Hearing, and staff presented the Local Hazard Mitigation Plan to the Council for approval. The City Council approved the submittal of the LHMP to CalOES and FEMA.
<b>Date</b>	<b>Final Board Meeting to Approve the LHMP -</b>



**1.7 PUBLIC REVIEW PROCESS**

Two PAC meetings were held where the LHMP was reviewed and discussed. The LHMP process was also presented to the City’s Public Safety Commission, which is made up of local citizens, at two of their monthly scheduled meetings. Comments from these meetings are included in **Table 4**.

The City of South Pasadena’s Planning Commission held a Public Hearing on April 11, 2023. The Commission allowed public comment at the meeting and recommended it be placed for additional community review.

On May 24, 2023, the City of South Pasadena’s Draft Local Hazard Mitigation Plan was made available to the public via the City’s website; it was sent out to interested stakeholders, and a hard copy was made available at City Hall, the Police Department, and the Fire Department’s front desks for a 30-day public review. The City Council conducted a second Public Hearing on August 16, 2023. After approving the Plan, they recommended that it be forwarded for review to CalOES and FEMA.

**1.8 PUBLIC COMMENTS**

**Table 4** lists the comments received during the public review process.

**Table 4 - Summary of Public Comments**

Initial PAC Meeting	
Commenter	Comments
Soraya Sutherland	Question about adding Evacuation Planning to the LHMP
Casey Law	Questions regarding LHMP and operational issues
Public Safety Commission Meetings	
Commenter	Comments
None	No comments on the plan were made
Second PAC Meeting	
Commenter	Comments
None	No comments on the Plan were made
City’s Website Publication	
Commenter	Comments
None	No comments on the Plan were made
City Council Public Hearing	
Commenter	Comments
Name	Comment
Name	Comment



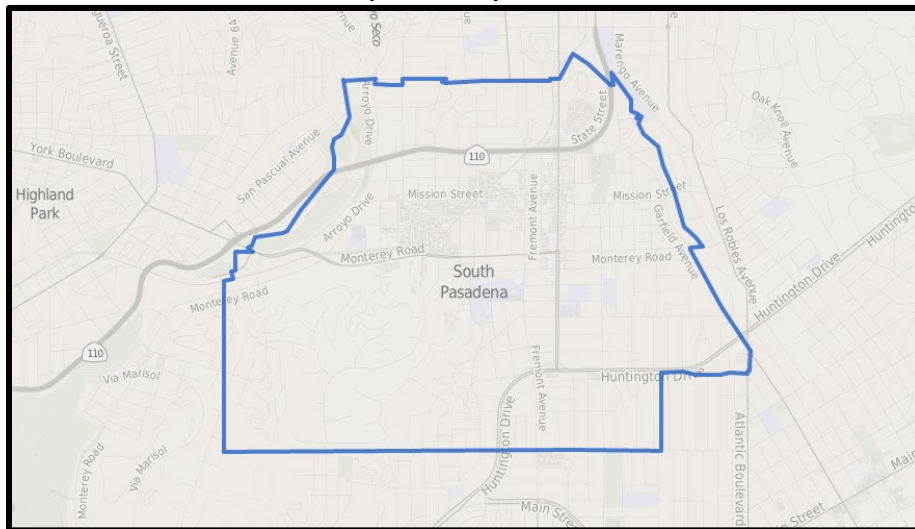


## Section Two - Community Profile

### 2.1 PHYSICAL SETTING

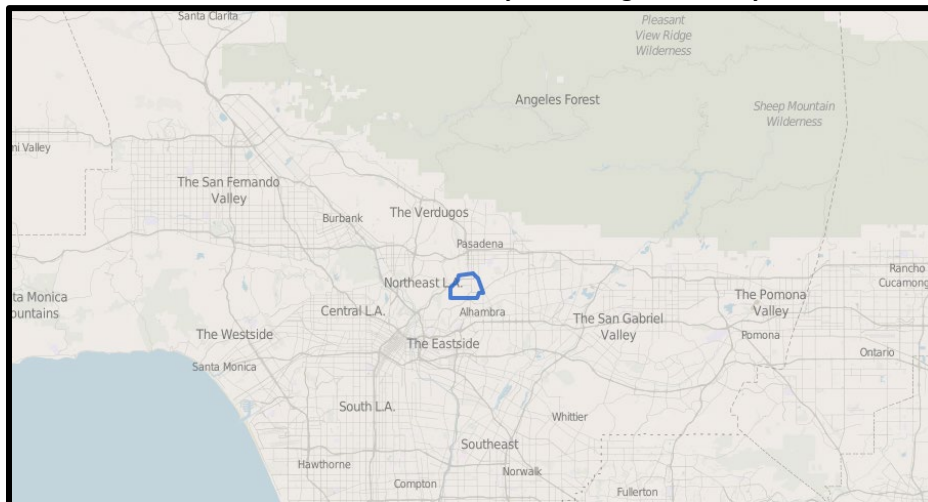
South Pasadena is located on the westernmost edge of the San Gabriel Valley. The City boundaries are generally defined by natural landmarks, including the Arroyo Seco watershed on the west, Raymond Hill on the north which divides the City from the City of Pasadena, and the Monterey Hills which straddles South Pasadena's southwest border with the City of Los Angeles. The cities of San Marino and Alhambra are located to the east and southeast.

**Exhibit 1 - Map of the City of South Pasadena**



Source: Los Angeles Times, Mapping L.A.

**Exhibit 2 - Location of the City in Los Angeles County**



Source: Los Angeles Times, Mapping L.A.



## 2.2 HISTORY OF SOUTH PASADENA

In early 1874, the area that is now South Pasadena was a part of the San Gabriel-Orange Grove Association. In 1875, the stockholders of the association voted to name their town Pasadena, and just three years later, residents living in the southern portion of Pasadena considered themselves South Pasadenans.

In February of 1888, South Pasadenans voted eighty-five to twenty-five for incorporation to control their territory. A board of trustees was elected, and Ammon B. Cobb was appointed as the first marshal, with Marshal B. Selmen as his deputy.

On March 2, 1888, South Pasadena officially incorporated with a population of slightly over 500. The City's boundaries established in 1889 are essentially the same today. South Pasadena consists of 3.44 square miles of prime residential property. In 1876, unimproved land with water sold from \$75 to \$150 an acre. Today a vacant lot in South Pasadena can be sold for more than \$200,000.



**Figure 1 - Cawston Ostrich Farm**

Source: City of South Pasadena, Citywide Historic Context Statement, December 16, 2014

Few cities in California are better recognized for the quality of their small-town atmosphere and rich legacy of intact late 19th and early 20th-century neighborhoods and residences. South Pasadena also firmly claims to have the San Gabriel Valley's oldest and most historic sites. For many centuries, its adjacency to a natural fording place along the Arroyo Seco had served as a gateway to travel and commerce for aboriginal peoples here and along the coast. It was here that Hahamognas greeted Portola and the missionaries who later established the San Gabriel Mission a few miles to the east.

The initial buildings on the Rancho San Pascual, which subsequently gave birth to the Cities of Pasadena, South Pasadena, and Altadena, were built here. The first of these adobe structures became headquarters for General Flores and his staff in 1847, when they agreed to surrender to American forces, ending Mexican Colonial rule in California.

In 1888, South Pasadena incorporated the southern portion of the Indiana Colony and extended south and westward to the Los Angeles border, becoming the sixth municipality in Los Angeles County. With the establishment of the Raymond Hotel and the Cawston Ostrich Farm, the small community was able to attract tourists and increasingly large waves of new residents to the Pasadena area in the late 19th and early 20th Centuries.



With the completion of the Pacific Electric Short Line, putting the entire city within easy walking distance of the “red car” stations, South Pasadena also became one of the first suburbs of Los Angeles. It is now certainly one of the best-preserved cities, maintaining a small-town quality and humanity in the scale of its buildings, its residential streetscapes, and its historic commercial core.

**Figure 2 - South Pasadena Train Station**

Source: City of South Pasadena, Citywide Historic Context Statement, December 16, 2014

**2.3 COMMUNITY PROFILE**

The City of South Pasadena has a population of approximately 25,478 residents (2020 U.S. Census estimate) within an area of 3.42 square miles. **Table 5 - Demographic, Economic, and Social Data for South Pasadena** provides an overview of the city’s population data, ethnicity, and education levels based on the 2020 5-Year estimates.

**Table 5 - Demographic, Economic, and Social Data for South Pasadena**

Population	
Total Population	25,478
Males	12,739 (50%)
Females	12,739 (50%)
Median Resident Age	39.5
Median Household Income	\$ 109,927
Per Capita Income	\$ 64,960
Median House Value	\$ 1,113,100
Ethnicity	
White (non-Hispanic)	40%
Black	4%
American Indian	0%
Asian	32%
Some Other Race	0%
Two or More Races	5%
Hispanic or Latino	19%
Education Attainment	
High school graduate or higher	97.2%
Bachelor's degree or higher	70.6%

Source: <https://censusreporter.org/profiles/16000US0673220-south-pasadena-ca/>



## **2.4 INFRASTRUCTURE**

The City’s existing infrastructure includes a variety of elements, including water, wastewater, and solid waste, that are central to the residents’ daily lives. The City wants to ensure these systems continue to operate past their intended life span and are adequate to meet the needs of a growing city. Most growth would be expected to occur in the Downtown area along Mission Street and Fair Oaks Avenue. The new development stimulated by a revised Downtown Specific Plan could be expected to exert minimal pressure on existing municipal water, sewer, power, gas, telecom, and street systems since the anticipated new development is relatively modest over a protracted period of time. A small growth increment focusing on office and mixed-use development is projected at the Ostrich Farm. Small neighborhood-scale infill development could revitalize the three centers along Huntington Drive at Fair Oaks Avenue/Freemont Avenue, and also at Fletcher Avenue and Garfield Avenue. The General Plan conservatively projects that the infill and redevelopment of these corridors and centers will largely mirror current land uses with some intensifying residential water use.

## **2.5 ECONOMIC TRENDS**

According to the City’s most recent Comprehensive Annual Financial Report (CAFR), General Fund revenues total approximately \$26.5 million, of which nearly \$20 million are attributable to tax revenues, which is generally in line with other similarly sized Southern California cities. Over half of the City’s tax revenues currently come from property taxes, which total \$10.1 million. Due to Proposition 13, property tax growth in California cities is limited to two percent each year, and assessed values only change when a property is sold, or there is new construction on that given property. The next largest revenue source is the City’s utility tax, totaling \$3.4 million and accounting for 17 percent of all tax revenues.

However, according to the City, utility tax revenues have declined since 2010 due to water and energy conservation efforts, decreasing demand for landline telephone services, and using alternative energy sources. Motor Vehicle in Lieu Fees (MVLFF) are the third largest revenue source, totaling \$2.5 million and representing 13 percent of the City’s tax revenues. MVLFF has generally increased with the City’s overall General Fund revenues. Sales taxes are the fourth largest revenue source, accounting for \$2.4 million and 12 percent of the City’s tax revenues. Notably, sales tax revenues have increased at an annual rate of six and a half percent since 2010, which is the highest growth rate among the City’s largest revenue sources over that timeframe.

The City is currently committed to funding a number of capital projects and has an estimated backlog of \$60 million in city-wide infrastructure repairs. In addition, like most California municipalities, City pension obligations will continue to expand, further burdening the City’s fiscal capacity. These commitments limit the City’s capacity to fund any other major capital improvements in the near future.

## **2.6 EXISTING LAND USE**

South Pasadena is a collection of highly desirable historic residential neighborhoods with many tree-lined streets. The community is diverse, with a rich mix of age, income, and race. The housing stock is evenly divided between multi-family and single-family residences. The majority of residents are renters who



tend to live in multi-family units.

Mission Street is the heart of the community, with a number of historic buildings, retail spaces, and cultural institutions within a walkable environment. The Metro L Line Station has sparked renewed interest in for-sale and rental housing in the downtown area. Growth opportunities tend to be limited as the City is built-out and strongly advocates for historic preservation.

**Table 6 - Planning (Land Use) Designations**

	<b>Very Low</b> (0-3.9 units/acre): This designation permits detached single-family homes and is characterized by lots over 10,000 square feet.
	<b>Low</b> (4-5.9 units/acre): This designation permits detached single-family homes and is characterized by 5,000 to 10,000 square feet.
	<b>Medium</b> (6-13.9 units/acre): This designation permits attached housing types, such as townhomes and duplexes and detached single-family homes on smaller lots.
	<b>High</b> (14-24 units/acre): This designation permits multi-family residential development. It is intended to identify and conserve existing concentrations of such development in the city. These areas are characterized by multi-story apartments and condominiums.
	<b>Mixed Use:</b> Encourages a wide range of building types depending on neighborhood characteristics that house a mix of functions, including commercial, entertainment, office, and housing with a maximum density of 70 units per acre. An intensity of 2.0FAR is permitted throughout the City. .
	<b>The Downtown Specific Plan:</b> Sees the Downtown as being shaped by two distinct corridors: Mission Street and Fair Oaks Avenue, that are adjacent and complimentary to one another. Both corridors have a clear historic center with commercial and retail uses surrounded by single and multi- family neighborhood fabric. The Mission Street corridor is centered on the light rail station. The Fair Oaks Avenue Corridor is centered on the Fair Oaks Avenue and Mission Street intersection. A maximum density of 70 units per acre is allowed.
	<b>Civic:</b> Accommodates civic functions such as government offices, libraries, schools, community center, and places of religious worship.
	<b>Parks &amp; Open Space:</b> Includes active and passive public parks of all sizes to maintain open space areas for public recreation and leisure resources. These zones can range from small pocket parks to larger community parks and may include playgrounds or other recreation facilities.
	<b>Conservation:</b> Intended to preserve the natural characteristics of properties that have been acquired by the City, while providing the public opportunities for recreation and passive enjoyment. Maintain as Open Space.
	<b>Conservation:</b> Intended to preserve the natural characteristics of properties that have been acquired by the City, while providing the public opportunities for recreation and passive enjoyment. Maintain as Open Space.

Source: City of South Pasadena General Plan

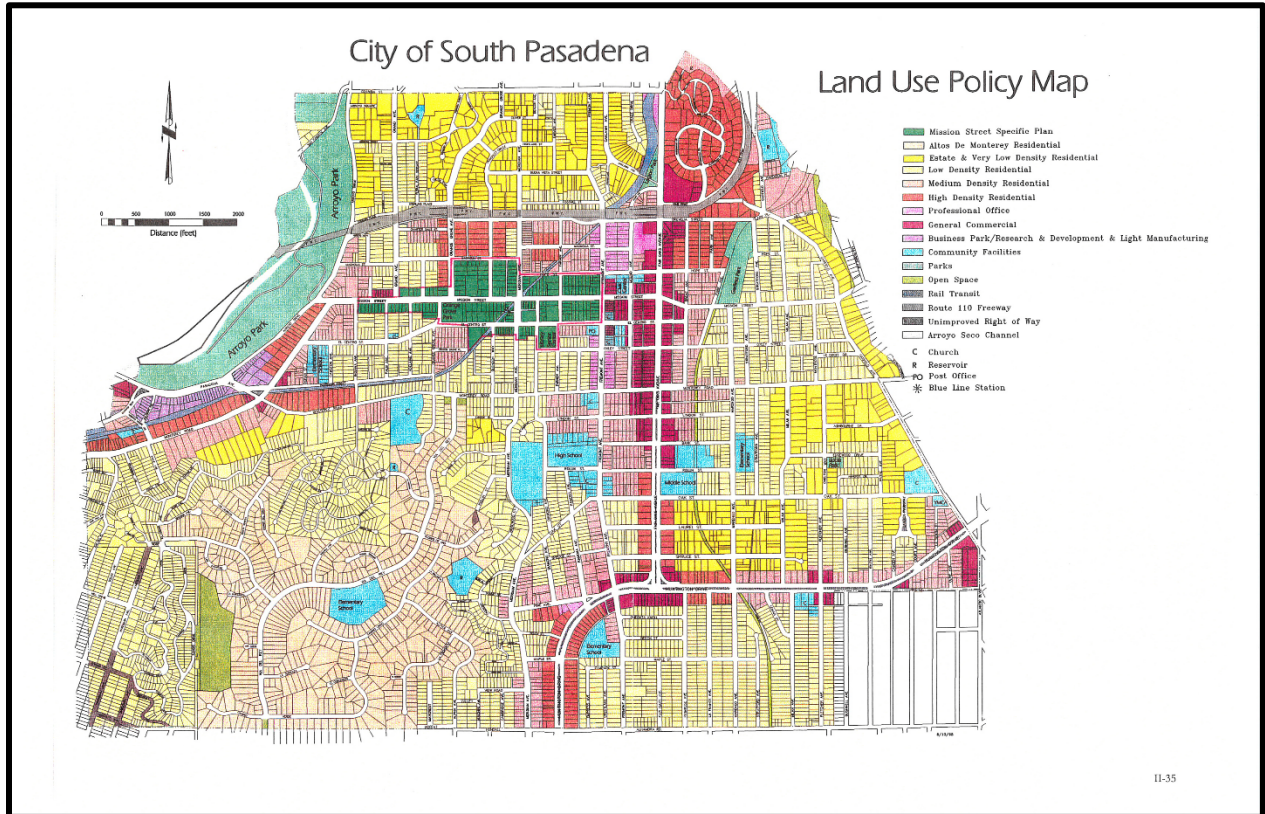




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**SECTION TWO**

**Exhibit 3 - Land Use Map**



Source: City of South Pasadena

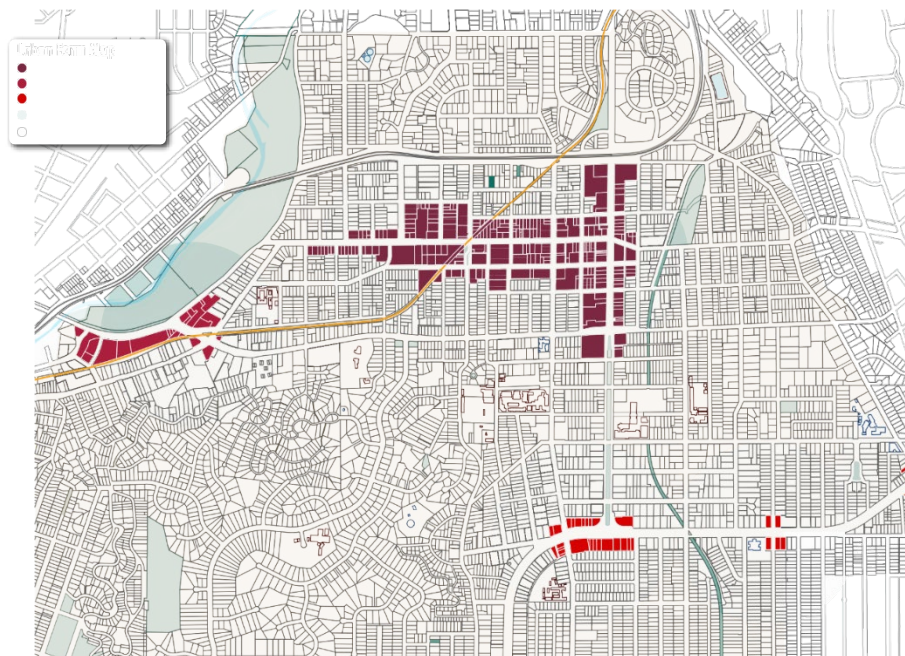


**2.7 DEVELOPMENT TRENDS**

The culmination of separate land use designations evolves into the geography of places that address the “form and character” of that place. The City’s General Plan guides the type of intended changes in different areas. The established areas are preserved and maintained, and areas with redevelopment opportunities are programmed for investment. The General Plan redirects growth to corridors in the Downtown area, Ostrich Farm District, and neighborhood centers along Huntington Drive in varying designs based on the existing infrastructure. This approach focuses on policies, regulations, and strategies to implement the community vision for specific areas. The City’s General Plan Housing Element provides policies to accommodate the 2,067 housing units the City must plan for to achieve the City’s Regional Housing Needs Allocation (RHNA) obligation. It is anticipated these RHNA units can be feasibly built in the areas contemplated by the proposed General Plan to accommodate such growth.

The primary urban forms include organizing place types, neighborhood centers, districts, and corridors. Listed in the following pages are place types recommended for moderate infill, redevelopment, or infrastructure improvements. Most of the new growth will be directed to Downtown and Ostrich Farm District corridors. The change to the urban form ranges from reinvestment in existing buildings and minor improvements to utility infrastructure and the public realm to the infill development that completes the prevalent development pattern. In some instances, adding new streets may be necessary to break the large-scale superblocks into pedestrian-oriented blocks or complete a block with otherwise missing buildings, open space, or infrastructure.

**Exhibit 4 - City of South Pasadena Urban Form Map**







**Development Trends - Districts:** Districts consist of streets or areas emphasizing specific types of activities and exhibiting distinct characteristics. A neighborhood or parts of neighborhoods can form a district.

**Figure 3 - Photo of South Pasadena Residential District**



Source: City of South Pasadena General Plan

**Residential Districts:** South Pasadena has an impressive collection of neighborhoods representing significant periods of the City’s growth, along with important individual examples of period architectural styles and works by prominent local architects. The striking and well-preserved architecture and tree-lined streets make these neighborhoods among the most desirable places to live in Southern California. The neighborhoods are comprised of single-family districts throughout the City, with multi-family districts located along the City’s main corridors. This Plan calls for the preservation of the built and natural assets within the residential districts. While no growth other than Accessory Dwelling Units (ADUs) is projected within the stable residential districts, the City will need to plan for the 2,067 housing units required by its RHNA obligation. This may require focused rezoning of certain neighborhoods near the L Line station and high-quality transit corridors (Fair Oaks Avenue and Huntington Drive).

**Figure 4 - Photo of Ostrich Farm**



Source: City of South Pasadena General Plan



The **Ostrich Farm** is the western gateway to the City. Once the home of Cawston’s Ostrich Farm, a provider of ostrich feathers and tourist attraction from 1896 to 1935, the site was later developed as a group of creative office suites buildings and live/work lofts. Creative Office Suites in the Ostrich Farm area are typically occupied by tenants who require large floor areas such as entertainment and design firms. Creative Office Suites are fully-equipped spaces that rent out various office spaces that range from shared spaces to large private offices and are desirable to boutique businesses, design firms, and small entertainment companies. The market study shows low vacancy and high demand for 185,000 to 370,000 square feet of creative office space over the next two decades. The vacant and underutilized parcels at Ostrich Farm represents South Pasadena’s greatest opportunity for creative office suite development, for significant amounts of new housing, or both. Creative office development could also support and enhance South Pasadena’s creative community. For sites adjacent to residential neighborhoods, mixed-use development with limited neighborhood-serving retail and transitional residential use may be appropriate. Better linkage to the Metro Gold Line Station would provide Ostrich Farm employees access to reliable transit. A Citywide public or private circulator shuttle service as part of a transportation demand management could link Ostrich Farm to downtown assets and the Metro “L” Line Station.

**Figure 5 - Photo of Metro “L” Line Station**



Source: City of South Pasadena General Plan

The “L” Line South Pasadena Station at Mission Street and Meridian Avenue is an existing mobility asset that could be better leveraged within the “walkshed” which includes a half-mile radius from the station. There are a number of locations within a half-mile of the station – within its walkshed, which includes much of Downtown South Pasadena – where “first/last mile” access to the station and transportation conditions more generally could be improved. This would serve to improve the accessibility of the station and increase transit ridership; it would also improve safety and mobility for non-users of the station who are traveling through the area.



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## **2.8 FUTURE DEVELOPMENT**

While there is relatively strong demand for residential, office, and retail uses within South Pasadena, the actual amount and scale of development that can occur is limited by the amount of available land, financial feasibility of new development, fiscal priorities, and the level of acceptable density aligned with community character and vision. For residential uses, the scale and character of new development based on available opportunities differs by area. Whereas smaller mixed-use infill development is appropriate for Mission Street, Fair Oaks Avenue and Huntington Drive can accommodate larger buildings by redeveloping suburban retail centers and large surface parking lots.

In general, new residential development, particularly multifamily, is essential to bolster the City’s tax base, supporting new and existing retail by providing customers, promoting an active urban character, and can potentially help to mitigate traffic impact by locating new development near transit. The City’s RHNA obligation requires planning for 2,067 additional housing units by October 2029. The City intends to direct this growth into the Downtown area near the L Line station, and in other areas of the city like the Ostrich Farm District, Fair Oaks Avenue, and Huntington Drive, where such growth is appropriate. Office uses will likely involve new development and the adaptive reuse of underutilized buildings and spaces. However, office development’s financial feasibility will require creative parking and design approaches. As with encouraging residential growth, increasing employment in the City bolsters local restaurants and retail by providing a more significant customer base and particularly generates daytime shopping and dining activity.

Finally, as the City’s sales tax revenues are an increasingly important revenue source, enhancing the retail tax base is key to fiscal sustainability. Historically, retail growth in the City has been “organic” and has occurred without a concerted effort to attract and grow particular retail businesses. However, a targeted retail strategy that focuses on creating a specialty shopping and dining destination can fully leverage the distinct market opportunity to form a retail cluster focused on “high-design” and local “flavor.” Ultimately, this will likely involve a mix of small, independent, national credit retailers that provide a holistic array of products and services to the local market and help ensure fiscal stability. Additionally, the growth of office and residential uses will be vital to increasing the daytime population, which is key to supporting a robust retail environment.

Overall, achieving a balanced mix of uses will best position the City to achieve urban vitality and fiscal sustainability. Locating employment, residents, and shopping and dining opportunities in close proximity will synergistically affect each other, promoting economic dynamism and walkability. However, as residential uses command a premium compared to retail and office uses in the City, including residential uses in new development may be integral to making mixed-use developments financially feasible.

In addition, the City’s General Plan update reflects that any new development in other areas of the city will require additional mitigation efforts, such as requiring fire-resistant building materials for all structures in hillside areas, encouraging the use of fire-resistant landscaping, requiring home sprinklers, ensuring the protection of residents from geologic and groundwater hazards, requiring a full site-specific geologic study of any hillside site within the purview of the hillside ordinance where site-specific questions such as slope stability, erosion, subsidence, and groundwater runoff.



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## Section Three - Risk Assessment and Hazard Identification

### 3.1 WHAT IS RISK ASSESSMENT

Conducting a risk assessment can provide information regarding the location of hazards, the value of existing land and property in hazard locations, and an analysis of risks to life, property, and the environment that may result from natural, technological, and human-caused hazard events. Specifically, the four levels of a risk assessment are:

- Hazard Identification
- Profiling Hazard Events
- Vulnerability Assessment/Inventory of Existing Assets
- Risk Analysis

### 3.2 RISK ASSESSMENT METHODOLOGY

Each hazard profile was determined by the methodology described in the section above. In addition, replacement and contents values for the facilities within the hazard areas are tallied in each vulnerability table to estimate the potential losses to each hazard. It should be noted that the actual losses will depend on the type and extent of the hazard event.

### 3.3 HAZARD IDENTIFICATION AND PRIORITIZATION

#### 3.3.1 HAZARD IDENTIFICATION

Using the previous South Pasadena Local Hazard Mitigation Plan (2019) and the FEMA hazard mitigation planning guidance as a reference, the Technical Advisory Committee discussed a comprehensive list of natural hazards during the meeting on June 8, 2022. This discussion resulted in the identification of the hazards which pose a potential risk to the City of South Pasadena. **Table 7: 2023 City of South Pasadena Hazard Identification** summarizes the TAC's discussion for each of the natural hazards and shows which were identified, as highlighted, for inclusion in the Plan.

#### 3.4 REVIEW OF EXISTING PLANS AND TECHNICAL INFORMATION

TAC members reviewed the General Plan, land use documents, hillside planning requirements, wildfire related plans, and City operational plans to assist in the determination of risk. These specific documents are highlighted in **Section 5.7**.



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**Table 7 - South Pasadena Hazard Identification**

List of Hazards	Identified in 2019 LHMP	Included in 2023 LHMP	Discussion Summary
Aircraft Accident	No	No	
Agricultural Pests	No	No	
Avalanche	No	No	
Climate Change	N/A	N/A	Climate change will be considered a factor for all the identified hazards.
Coastal Erosion	No	No	
Coastal Storm	No	No	
Dam Failure	No	No	
Drought and Water Resource	Yes	Yes	
Earthquake	Yes	Yes	
Erosion	No	No	
Expansive soils	No	No	
Extreme Temperature	No	No	
Flooding	No	No	
Geological Hazards	N/A	N/A	This category is included in other hazard profiles.
Hailstorms	No	No	
Hazardous Materials and Human Caused	Yes	Yes	
Hurricane	No	No	
Land Subsidence	No	No	
Lightning	No	No	
Landslide and Mudflow	Yes	Yes	



**Table 7 - South Pasadena Hazard Identification (Continued)**

List of Hazards	Identified in 2019 LHMP	Included in 2023 LHMP	Discussion Summary
Human-Caused Hazards	N/A	N/A	Except for Hazardous Materials Spills, this plan intends to focus on natural hazard risk.
Reservoir Failure	Yes	Yes	
Sea Level Rise	No	No	
Severe Storms and Localized Flooding	Yes	Yes	
Storm Surge	No	No	
Subsidence	No	No	
Tornado	No	No	
Tsunami	No	No	
Volcano	No	No	
Wildland and Urban Fires	Yes	Yes	
Windstorm	Yes	Yes	

**3.5 CALCULATED PRIORITY RISK INDEX AND THE HAZARD RANKING WORKSHEET**

This Plan used two methods for determining the Hazard and Risk Analysis for the City. The first used is the Calculated Priority Risk Index (CPRI), a FEMA-recommended ranking method that allows for the comparison of disparate hazard categories. The second is the Hazard Ranking Worksheet that was used in the previous LHMP from 2019. This worksheet calculates risk differently, giving definitive rankings as Limited, Moderate, and High. The CPRI produces the results numerically. The CPRI is obtained by assigning values to risk categories:

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

There are four varying degrees of risk for each of the risk categories from which to choose: 1, 2, 3, or 4. Zero (0) is the value used when an option is not assigned. Refer to **Table 8**.



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**Table 8 - CPRI Hazard Ranking System**

CPRI Category	Degree of Risk			Assigned Weighting Factor
<b>Probability</b>	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 two 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 one every year (>10%).	4	
<b>Magnitude Or Severity</b>	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 no deaths exist. Moderate loss of quality of life. Shutdown of critical public facilities for more than one day and less than one 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 one death. Shutdown of critical public facilities for more than one week and less than one 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 one month.	4	



**Table 8 - CPRI Hazard Ranking System (Continued)**

CPRI Category	Degree of Risk			Assigned Weighting Factor
<b>Warning Time</b>	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	
	6 - 12 hours	Population will receive 6 - 12 hours of warning.	3	
	Less than 6 hours	Population will receive less than 6 hours of warning.	4	
<b>Duration</b>	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 one week	Disaster event will last between 24 hours and one week.	3	
	More than one week	Disaster event will last more than one week.	4	

Refer to **Table 10** for the City of South Pasadena results based on the CPRI Hazard Ranking System.





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**3.4.1 CALCULATED PRIORITY RISK INDEX ASSESSMENT**

**Table 9 - CPRI Risk Assessment for the City of South Pasadena**

Hazard	Probability		Magnitude		Warning Time		Duration		Weighted Total
	Score	Weight	Score	Weight	Score	Weight	Score	Weight	
Earthquake	3	1.35	3	0.9	4	0.6	4	0.4	3.25
Severe Storms and Localized Flooding	4	1.9	2	0.6	1	0.15	2	0.2	2.75
Landslide and Mudflow	2	0.9	2	0.6	4	0.6	3	0.3	2.4
Wildland and Urban Fire	3	1.35	3	0.9	4	0.6	2	0.2	3.05
Hazardous Materials & Human Caused	1	0.45	2	0.6	4	0.6	2	0.2	1.85
Windstorm	3	1.35	3	0.9	1	0.15	2	0.2	2.6
Drought and Water Resource	3	1.35	2	0.9	1	0.15	5	0.5	2.9
Reservoir Failure	1	0.45	4	1.2	3	0.45	4	0.4	2.4

As noted, the other tool used in ranking risk is the **Hazard Ranking Worksheet**, noted in **Table 10**. It was also used to give an overall analysis of the City of South Pasadena. These results are noted in **Table 11, Descriptive Planning Analysis by Hazard**.

It should be noted that both ranking tools showed almost identical hazard rating levels for the city.



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**Table 10 - Hazard Ranking Worksheet**

Probability		Importance	2.0	Secondary Impacts		Importance	0.5
Based on estimated likelihood of occurrence from historical data				Based on estimated secondary impacts to the community at large			
<u>Probability</u>		<u>Score</u>		<u>Impact</u>		<u>Score</u>	
<b>Unlikely</b> (Less than 1% probability in next 100 years or has a recurrence interval of greater than every 100 years.)		1		<b>Negligible</b> - no loss of function, downtime, and/or evacuations		1	
<b>Somewhat Likely</b> (Between 1 and 10% probability in next year or has a recurrence interval of 11 to 100 years.)		2		<b>Limited</b> - minimal loss of function, downtime, and/or evacuations		2	
<b>Likely</b> (Between 10 and 100% probability in next year or has a recurrence interval of 10 years or less.)		3		<b>Moderate</b> - some loss of function, downtime, and/or evacuations		3	
<b>Highly Likely</b> (Near 100% probability in next year or happens every year.)		4		<b>High</b> - major loss of function, downtime, and/or evacuations		4	
Affected Area		Importance	0.8	Total Score = Probability x Impact, where:			
Based on the size of geographical area of community affected by hazard				Probability = (Probability Score x Importance)			
<u>Affected Area</u>		<u>Score</u>		Impact = (Affected Area + Primary Impact + Secondary Impacts), where:			
<b>Isolated</b>		1		Affected Area = Affected Area Score x Importance			
<b>Small</b>		2		Primary Impact = Primary Impact Score x Importance			
<b>Medium</b>		3		Secondary Impacts = Secondary Impacts Score x Importance			
<b>Large</b>		4					
Primary Impact		Importance	0.7	Descriptive Hazard Planning Consideration			
Based on percentage of damage to the typical facility in the community				Total Score	(Range)	Distribution	Hazard Level
<u>Impact</u>		<u>Score</u>		0.0	12.0	1	<b>Limited</b>
<b>Negligible</b> - less than 10% damage		1		12.1	42.0	2	<b>Moderate</b>
<b>Limited</b> - between 10% and 25% damage		2		42.1	64.0	3	<b>Significant</b>
<b>Critical</b> - between 25% and 50% damage		3					
<b>Catastrophic</b> - more than 50% damage		4					
<p>The probability of each hazard is determined by assigning a level, from unlikely to highly likely, based on the likelihood of occurrence from historical data. The total impact value includes each hazard's affected area, primary impact, and secondary impact levels. Each level's score is reflected in the matrix. The total score for each hazard is the probability score multiplied by its importance factor times the sum of the impact level scores multiplied by their importance factors. Based on this total score, the hazards are separated into three categories based on the hazard level they pose to the communities: Significant, Moderate, and Limited.</p>							



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**3.4.2 DESCRIPTIVE PLANNING ANALYSIS BY HAZARD**

**Table 11 - Descriptive Planning Considerations by Hazard for the City of South Pasadena**

Hazard Type	Probability	Impact			Total Score	Descriptive Planning Consideration
		Affected Area	Primary Impact	Secondary Impacts		
Earthquake	4	3.20	2.10	1.50	31.20	<b>Moderate</b>
Severe Storms and Localized Flooding	6	2.40	1.40	0.50	25.80	<b>Moderate</b>
Landslide and Mudflow	2	0.08	0.07	1.00	4.00	<b>Limited</b>
Wildland and Urban Fire	4	2.40	2.10	1.50	24.00	<b>Moderate</b>
Hazardous Materials & Human Caused	6	0.08	0.07	0.50	12.00	<b>Limited</b>
Windstorm	4	3.20	2.10	1.00	25.20	<b>Moderate</b>
Drought and Water Resource	4	3.20	1.40	0.50	30.60	<b>Moderate</b>
Reservoir Failure	2	0.80	1.40	0.50	5.40	<b>Limited</b>

For additional information on the hazard analysis for each facility, refer to **4.10.2, Planning Analysis Assessments by Facility**.



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### 3.6 CRITICAL FACILITIES

The Technical Advisory Committee identified 23 critical facilities for incorporation in the hazard vulnerability/risk analysis. These facilities include the Civic Center complex, the Police Department and Fire Station, and other city-owned properties and facilities that provide essential services to the community. Damage to these facilities caused by a hazard event can impair response and recovery from the event and may lead to disruption of services. This list includes critical facilities owned and operated by the City and does not include other local government, state, or federal facilities outside of city control. Refer to **Table 12** below.

**Table 12 - South Pasadena Critical Facilities and Infrastructure**

#	Facility or Infrastructure Component	Estimated Replacement Value	Estimated Contents Value	Estimated Total Value
1	Civic Center Complex	\$3,915,330	\$1,045,505	\$4,960,835
3	Police and Fire Departments	\$6,884,410	\$663,593	\$7,548,003
3	Library & Community Room	\$11,305,773	\$5,109,225	\$16,434,998 *
4	Senior Center	\$1,812,686	\$75,838	\$21,366,476 *
5	Eddie Park	\$1,052,760	\$65,627	\$1,123,387 *
6	War Memorial	\$2,563,950	\$30,763	\$2,629,713 *
7	Recreation Center	\$1,791,803	\$67,981	\$1,861,284 *
8	Meridian Iron Works Museum	\$499,079	\$0	\$499,079
9	Garfield Park and Youth House	\$345,105	\$6,210	\$353,960 *
10	Public Works Yard	\$1,355,084	\$249,232	\$1,604,316
11	Garfield Reservoir	\$6,727,351	\$588,610	\$7,315,961
12	Grand Reservoir	\$1,195,542	\$6,181	\$1,201,723
13	Westside Reservoir	\$5,977,293	\$165,374	\$6,142,668
14	Kolle Pump House	\$481,499	\$0	\$481,499
15	Indiana Booster Station	\$673,553	\$0	\$673,553
16	Bilicke Water Tower	\$2,267,509	\$0	\$2,281,178
17	Raymond Tank	\$2,251,877	\$0	\$2,251,877

\* - Includes Rental Value



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**Table 12 – City of South Pasadena Critical Facilities and Infrastructure (Continued)**

#	Facility or Infrastructure Component	Estimated Replacement Value	Estimated Contents Value	Estimated Total Value
18	Wilson Reservoir (Located in the City of San Gabriel)	\$4,984,403	\$337,902	\$5,322,305
19	Mission Meridian Village Parking	\$15,726,015	\$1,237	\$15,760,252 *
20	Graves Reservoir (Located in the City of San Marino)	\$12,947,971	\$589,705	\$13,537,676
21	San Pasqual Stables	\$6,241,015	\$51,000	\$6,292,015 *
22	Arroyo Seco Golf Course	\$564,632	\$182,736	\$968,733 *
23	Arroyo Seco Racquet Club	\$1,558,271	\$0	\$1,558,271
24	Arroyo Seco Park	\$174,014	\$0	\$174,014
<b>Total</b>		<b>\$131,886,589</b>	<b>\$17,169,538</b>	<b>\$150,389,869</b>

\* - Includes Rental Value

See **Exhibit 5, Location of City of South Pasadena Facilities**, on the following page.

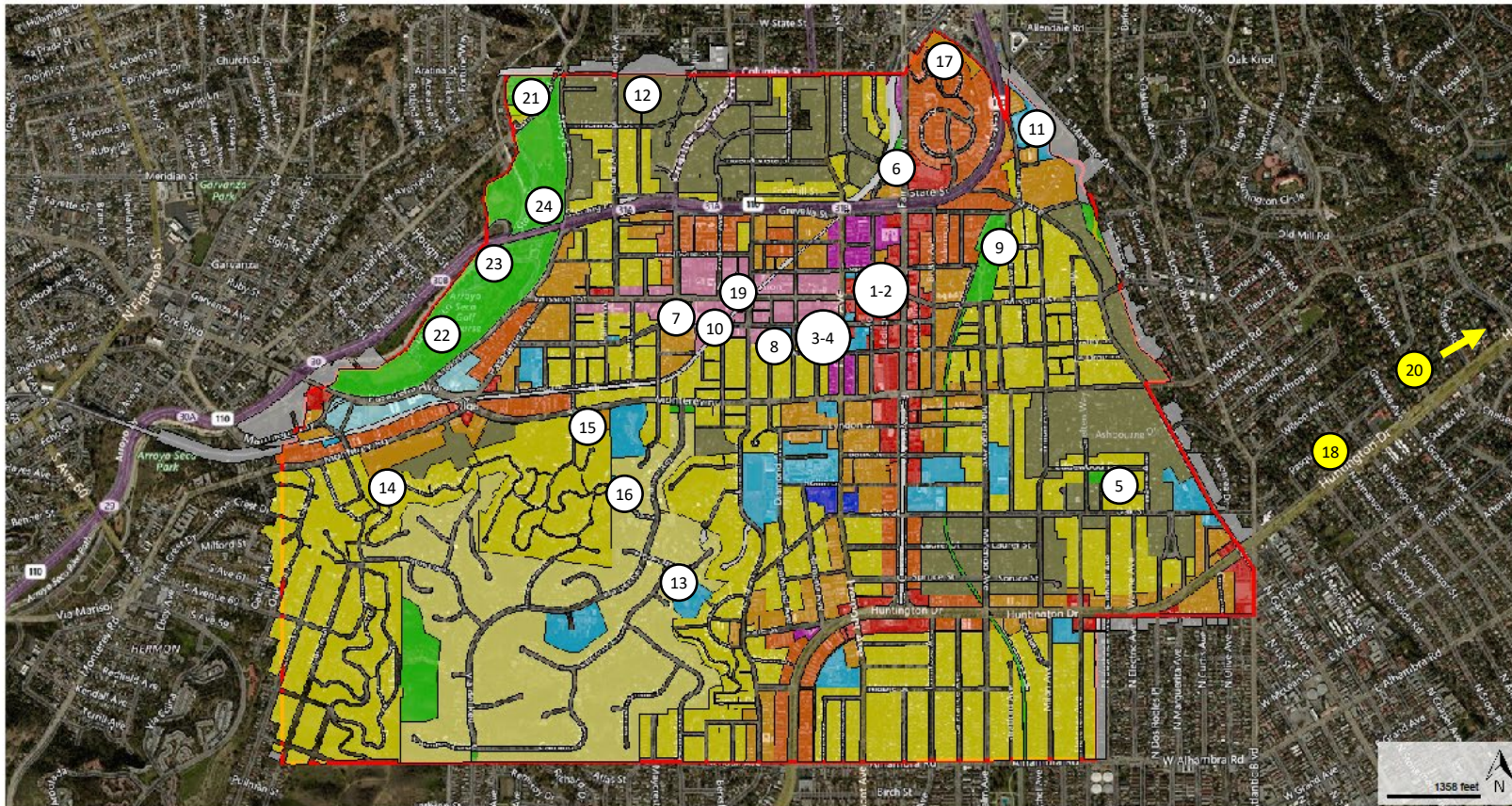




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**Exhibit 5 - Location of City of South Pasadena Facilities (Refer to Facility Number on Previous Page)**



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Source: City of South Pasadena





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**Table 13 - City of South Pasadena Identified Hazards and Planning Considerations**

<b>Identified Hazard</b>	<b>Hazard Planning Consideration</b>
Earthquake	Moderate
Severe Storms and Localized Flooding	Moderate
Landslide and Mudflow	Limited
Wildland and Urban Fire	Moderate
Hazardous Materials & Human Caused	Limited
Windstorm	Moderate
Drought and Water Resource	Moderate
Reservoir Failure	Limited

### **3.7 HAZARD CHANGE CONSIDERATIONS**

The TAC determined that there have been no significant changes to hazard prone areas City-wide since the 2019 Local Hazard Mitigation Plan was implemented. The risks associated in the previous LHMP remain the same.

### **3.8 CLIMATE CHANGE CONSIDERATIONS**

Climate change is a serious issue, as it affects communities in various ways. In the City of South Pasadena, climate change can result in many impacts and potentially exacerbate existing natural and human-caused hazards or create new hazards. This Plan has identified climate change considerations within each hazard profile in the document to address potential climate change impacts. These considerations deal with changing weather patterns, precipitation regimes, and other hazards that these changing conditions could exacerbate. Within each hazard profile, the plan has discussed some potential impacts of climate change. This discussion is intended to supplement, but not replace, the **Probability of Future Events** discussion.



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## **Section Four - Hazards Affecting the City**

### **4.1 Earthquake**

#### **Identifying Earthquake Hazards**

An earthquake is a sudden release of energy in the earth's crust. Caused by movement along fault lines, earthquakes vary in size and severity. The focus of an earthquake is found at the first point of movement along the fault line (which may be beneath the surface), and the epicenter is the corresponding point above the focus at the earth's surface. Damage from an earthquake varies with the local geological conditions, the quality of construction, the energy released by the earthquake, the distance from the earthquake's focus, and the type of faulting that generates the earthquake. Earthquake-related hazards include primary impacts (fault rupture and ground shaking) and secondary impacts (liquefaction). This hazard profile will discuss ground shaking and liquefaction since these are the most likely impacts anticipated due to an earthquake.

Ground motion/shaking is the primary cause of earthquake damage and injury. It can result in surface rupture, liquefaction, landslides, lateral spreading, differential settlement, tsunamis, and building and infrastructure failure, which could lead to fire and other collateral damage. Typically, areas underlain by thick, water-saturated, unconsolidated material will experience more significant shaking motion than areas underlain by firm bedrock, but, in some cases, topographic relief may intensify shaking along ridge tops, where landslides may develop.

Fires and structural failure are the most hazardous results of ground shaking. Most earthquake-induced fires start because of ruptured power lines, gas lines, or electrically powered stoves and equipment. Structural failure is generally a result of age, quality, and building construction.

Liquefaction is the transformation of loose, water-saturated granular materials (such as sand and silt) from a solid to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures.

Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many Southern California communities are highly likely to encounter such risks, especially in areas with steep slopes. Historically, hillsides in the City of South Pasadena have not experienced slope failure due to earthquakes.



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## Location

South Pasadena is located at the boundary between two of Southern California's geomorphic provinces in an area that is being compressed by geologic forces associated with the movement of the Pacific and North American tectonic plates. Bounded by the San Andreas Fault system on the north and the Sierra Madre fault zone on the south, the mountains are essentially a large block of the Earth's crust that has been squeezed up and thrust over the valley floor by north-south compression along the San Andreas tectonic plate boundary. Displacements on faults at the northern edge of the Los Angeles Basin and the San Gabriel Valley are mainly of the thrust or thrust-oblique type, causing older geologic units to be pushed up along a series of faults that dip northward beneath the mountains they form. The most dramatic example of this in the South Pasadena area is the Sierra Madre fault zone, which has thrust ancient crystalline rocks onto and over younger sediments filling the valley.

The San Gabriel Valley is composed of alluvial fan sediments that have a range of ages coincident with the rise of the San Gabriel Mountains. Because the fans were built up naturally with sediments shed from the mountains, their composition reflects the rocks eroded by various streams. Most of South Pasadena is underlain by old alluvium consisting of unconsolidated gravel, sand, silt, and clay containing decomposed boulders of granitic rock from the mountains to the north and west that form the upland portions of the city. The upper alluvium is usually a loose to medium-dense silty sand underlain by discontinuous beds of moderately dense sand and gravelly sand.

The **San Andreas Fault** is the principal boundary between the Pacific and North American plates. As such, it is considered the "Master Fault" because it has frequent (geologically speaking) large earthquakes and controls the seismic hazard in southern California. The fault extends over 1,000 miles (1,600 kilometers) from near Cape Mendocino in northern California to the Salton Sea region in southern California. At its closest approach, the San Andreas Fault is approximately 21 miles (33 km) north of South Pasadena.

Significant faults, such as the San Andreas Fault, are generally divided into segments to evaluate future earthquake potential. The segments are generally defined at discontinuities along the fault that may affect the rupture length. In central and southern California, the San Andreas Fault zone is divided into five segments named, from north to south, the Cholame, Carrizo, Mojave, San Bernardino Mountains, and Coachella Valley segments (WGCEP, 1995). Each segment is assumed to have a characteristic slip rate (rate of movement averaged over time), recurrence interval (time between moderate to large earthquakes), and displacement (amount of offset during an earthquake). While this methodology has some value in predicting earthquakes, historical records and studies of prehistoric earthquakes show that more than one segment can rupture during a large quake or for ruptures to overlap into adjacent segments.

The last major earthquake on the southern portion of the San Andreas Fault was the 1857 Fort Tejon (M 8) event. This is the largest earthquake reported in California. The 1857 surface rupture broke the Cholame, Carrizo, and Mojave segments, resulting in displacements of as much as 27 feet (9 meters) along the rupture zone. Peak ground accelerations in the San Gabriel Valley area due to the 1857 earthquake are estimated to have been as high as 0.23g. These fault segments are thought to have a recurrence interval between 104 and 296 years.



The Mojave segment of the San Andreas fault is 83 miles (133 km) long, extending from approximately Three Points southward to just northwest of Cajon Creek, at the southern limit of the 1857 rupture (WGCEP, 1995). Using a slip rate of  $30\pm 8$  millimeters per year (mm/year) and a characteristic displacement of  $4.5\pm 1.5$  meters (m), the WGCEP (1995) derived a recurrence interval of 150 years for this segment. The Mojave segment is estimated to be capable of producing a magnitude 7.1 earthquake, which could result in peak ground accelerations in the South Pasadena area of between 0.13g and 0.16g. The WGCEP (1995) calculated that this segment has a 26 percent probability of rupturing sometime between 1994 and 2024.

The San Bernardino Mountains segment extends approximately 49 miles (78 km) from Cajon Creek to the San Gorgonio Pass. This segment is a structurally complex zone that is poorly understood and for which there are scant data on fault behavior. Using a slip rate of  $24\pm 5$  mm/year and a characteristic displacement of  $3.5\pm 1.0$  m, the 1995 WGCEP derived a recurrence interval on this fault of 146 years. This fault segment is estimated to produce a magnitude 7.3 earthquake, resulting in peak ground accelerations in San Gabriel between 0.11g and 0.13g. If this fault segment ruptures with the Mojave and Coachella Valley segments, higher ground motions would be expected. In 1994, the WGCEP (1995) calculated that this fault segment had a 28 percent probability of rupturing sometime in the next 30 years.

The Coachella Valley segment is about 71 miles (114 km) long and extends from San Gorgonio Pass to the Salton Sea. This segment has not produced any large surface-rupturing earthquakes in historical times (Sieh and Williams, 1990.) Paleoseismic studies suggest that the last surface-rupturing earthquake on this segment occurred around 1680. The data also suggest that during the 1680 earthquake and the one before that, in 1450, both the Coachella Valley and San Bernardino Mountain segments ruptured simultaneously. Using a slip rate of  $25\pm 5$  mm/year and a characteristic displacement of 4.0 (+4,-2) m, the 1995 WGCEP derived a recurrence interval for this fault of  $220\pm 13$  years. This segment can produce a magnitude 7.4 earthquake, resulting in peak ground accelerations in the South Pasadena area from 0.12g to 0.13 g. The WGCEP (1995) also calculated a 22 percent probability that this fault segment will generate an earthquake sometime between 1994 and 2024.

The **Raymond Fault** is a left-lateral, strike-slip fault about 13 miles (20 km) long that extends across the northern section of South Pasadena. Refer to Exhibit 6 – Raymond Fault Map. The fault is arcuate in shape, trending east-west in its western section and east-northeast in its eastern section. The fault produces a very obvious south-facing scarp along much of its length, which led many geologists to favor reverse slip as the predominant sense of fault motion. However, left-deflected channels, shutter ridges, sag ponds, and pressure ridges indicate that the Raymond Fault is predominantly a left-lateral strike-slip fault. This sense of motion is confirmed by the seismological record, especially the main shock and aftershock sequence to the 1988 Pasadena earthquake of local magnitude (ML) 5.0 that probably occurred on this fault (Jones et al., 1990; Hauksson and Jones, 1991). The Raymond fault appears to transfer slip southward from the Sierra Madre fault zone to other fault systems.

The Raymond Fault was recently trenched in San Marino and at the Los Angeles Arboretum in Arcadia (Weaver and Dolan, 2000), where significant data on the recent history of this fault were collected. These studies indicate that the most recent surface-rupturing earthquake on this fault occurred 1,000 to 2,000 years ago and that between three and five earthquakes occurred on this fault between 41,500 and 31,500



years ago. This suggests that the fault either breaks in cluster earthquakes or several more surface-rupturing earthquakes have occurred on this fault that has not been detected in the trenches. Weaver and Dolan (2000) also indicate that the Raymond fault may rupture alone or with other nearby faults, such as the Hollywood fault. A strike-slip rate of 4 (+1, -0.5) mm/year on the Raymond fault was recently estimated from paleoseismic data (Marin et al., 2000; Dolan et al., in review). In California, each earthquake is followed by revisions and improvements in the Building Codes. The 1933 Long Beach resulted in the Field Act, affecting school construction. The 1971 Sylmar earthquake brought another set of increased structural standards. Similar re-evaluations occurred after the 1989 Loma Prieta and 1994 Northridge earthquakes. These code changes have resulted in more substantial and earthquake-resistant structures.

The **Verdugo Fault** is a 13-mile (21 km) long, southeast-striking fault that lies along the southern border of the Verdugo Mountains near Burbank. The fault has been interpreted as a reverse fault (Wesnousky, 1986) and a left-lateral strike-slip fault (Walls et al., 1998). Weber et al. (1980) first reported southwest-facing scarps 2 to 3 meters high in the alluvial fan deposits in the Burbank and West Glendale areas and other subsurface features indicative of faulting. Since Weber et al.'s study (1980), no additional surface data on this fault has been published. Recently, however, several investigators began reviewing the subsurface geology in this area (Tsutsumi and Yeats, 1999; Langenheim et al., 2000; Pujol et al., 2001). Results of these studies suggest that the Verdugo fault changes in character from a reverse fault adjacent to the Pacoima Hills to a normal fault at the southwest edge of the Verdugo Mountains. Vertical separation on the fault is at least 1000 meters (Tsutsumi and Yeats, 1999).

Additional studies will be required to resolve these inconsistencies in the style of faulting. Given its location near highly populated portions of the Los Angeles metropolitan area, several investigations, including trenching of the fault, are likely to be conducted in the next few years to better define this fault's seismic hazard. The slip rate on the Verdugo fault is poorly constrained and estimated at 0.5 mm/year (CGS, previously CDMG, 1996). The fault's recurrence interval is unknown. The southern segment of the fault is thought to have ruptured during the Holocene; therefore, the fault is considered active (Jennings, 1994). The Verdugo fault can generate magnitude 6.0 to 6.8 earthquakes based on length. A magnitude 6.7 earthquake on this fault would generate peak ground accelerations in the San Gabriel Valley area between 0.53g and 0.64g.

The **Sierra Madre Fault Zone** is a north-dipping reverse fault zone approximately 47 miles (75 km) long. It extends along the southern flank of the San Gabriel Mountains from San Fernando to San Antonio Canyon, where it continues southeastward as the Cucamonga fault. The Sierra Madre fault has been divided into five segments, each with a different activity rate. The northwestern most segment of the Sierra Madre fault (the San Fernando segment) ruptured in 1971, causing the Mw 6.7 San Fernando (or Sylmar) earthquake. As a result of this earthquake, the Sierra Madre fault has been known to be active. In the 1980s, Crook and others (1987) studied the Transverse Ranges using general geologic and geomorphic mapping, coupled with a few trenching locations, and suggested that the segments of the Sierra Madre fault east of the San Fernando segment have not generated major Earthquakes in several thousands of years, and possibly as long as 11,000 years. By California's definitions of active faulting, most of the Sierra Madre fault would therefore be classified as not active. Then, in the mid-1990s, Rubin and others (1998) trenched a section of the Sierra Madre fault in Altadena (at Loma Alta Park) and determined that this segment has ruptured at least twice in the last 15,000 years, causing magnitude 7.2 to 7.6 earthquakes.



This suggests that the Los Angeles area is susceptible to infrequent but large near-field earthquakes on the Sierra Madre fault. Rubin et al.'s (1998) trenching data show that during the last earthquake, this fault trace shifted as much as 13 feet (4 meters) at the surface and that total displacement in the last two events added to more than 34 feet (10.5 meters)

Although the fault seems to slip at a rate of only about 0.6 mm/year, it can accumulate significant strain over time. The paleoseismic data obtained at the Loma Alta Park site were insufficient to estimate the recurrence interval and the age of the last surface-rupturing event on this fault segment. However, Tucker and Dolan (2001) trenched the east Sierra Madre fault at Horsethief Canyon and obtained data consistent with Rubin et al.'s (1998) findings. At Horsethief Canyon, the Sierra Madre fault last ruptured more than 8,000 years ago. Thus, using a slip rate of 0.6 mm/year and a slip per event of 5 meters, we can calculate a recurrence interval of about 8,000 years. If the last event occurred more than 8,000 years ago, it is possible that these segments of the Sierra Madre fault are near the end of their cycle and, therefore, likely to generate an earthquake in the not-too-distant future.

The **Elysian Park Fault** first came to light after the Whittier Narrows earthquake of October 1, 1987, occurred on a previously unknown blind thrust fault underneath the eastern part of the Los Angeles basin. Davis et al. (1989) used oil field data to construct cross-sections showing the subsurface geology of the basin and concluded that the Whittier Narrows earthquake occurred on a thrust ramp they called the Elysian Park thrust fault. They modeled the Elysian Park as a shallow-angle, reverse-motion fault 6 to 10 miles below the ground surface generally located between the Whittier fault to the southeast and the Hollywood Fault to the west-northwest. Although blind thrusts do not extend to the Earth's surface, they are typically expressed at the surface by a series of hills or mountains. Davis et al. (1989) indicated that the Elysian Park thrust ramp is expressed at the surface by the Santa Monica Mountains and the Elysian, Repetto, Montebello, and Puente Hills.

Davis et al. (1989) estimated a long-term slip rate on Elysian Park between 2.5 and 5.2 mm/yr. Dolan et al. (1995) used a different approach to estimate a slip rate on the Elysian Park fault of about 1.7 mm/year with a recurrence interval of about 1,475 years. Then, in 1996, Shaw and Suppe re-interpreted the subsurface geology of the Los Angeles basin, proposed a new model for the Elysian Park trend, and estimated a slip rate on the thrust ramp beneath the Elysian Park trend of  $1.7 \pm 0.4$  mm/yr.

More recently, Shaw and Shearer (1999) relocated the main shock and aftershocks of the 1987 Whittier Narrows earthquake and showed that the earthquake sequence occurred on an east-west trending buried thrust they called the Puente Hills thrust (rather than the northwest-trending Elysian Park thrust).

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law directly resulted from the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard.

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





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As discussed above, ground shaking potential can be expressed qualitatively using the Modified Mercalli Scale or quantitatively by the PGHA (peak horizontal ground acceleration). The PGHA value is calculated based on the so-called maximum credible earthquake or the seismic event considered likely to occur on an active fault affecting the city. In the City of South Pasadena, the Los Angeles segment of the Puente Hills blind thrust fault represents the controlling force for calculating the PGHA. Assuming a magnitude 6.5 earthquake on this fault, the best PGHA estimate is 0.5 g for loose soils (alluvium) and 0.55 g for bedrock. This level of ground shaking translates to an approximate Modified Mercalli Scale intensity of IX for the entire city. See **Table 15: Modified Mercalli Intensity Scale for Earthquakes**.

A significant earthquake produced along any of the regional fault systems has the potential to produce strong ground shaking in South Pasadena. Experience from the Whittier Narrows (1987) and Northridge (1994) earthquakes has shown that ridge-top locations in the city and near the margins of alluvial basins may be susceptible to elevated levels of ground shaking.

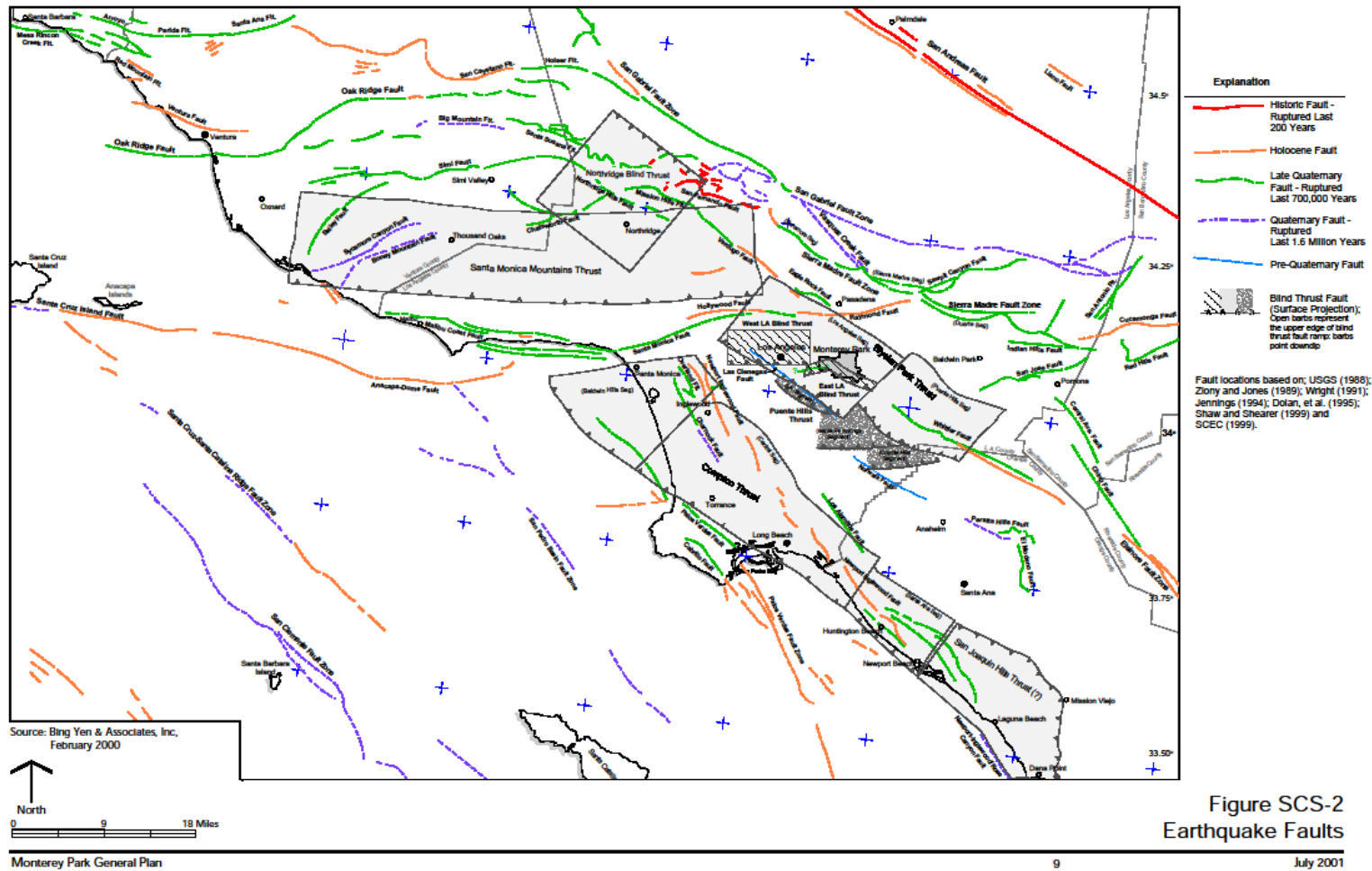
Seismic risks associated with both regional fault systems and the local blind thrust faults underlying the City of South Pasadena emphasize the need to ensure that all new development projects - and the retrofit of existing structures - incorporate appropriate design features to guard against widespread property damage and loss of life in the event of an earthquake.



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## SECTION FOUR

### Exhibit 6 - Southern California Active Fault Zones



Source: Southern California Earthquake Center



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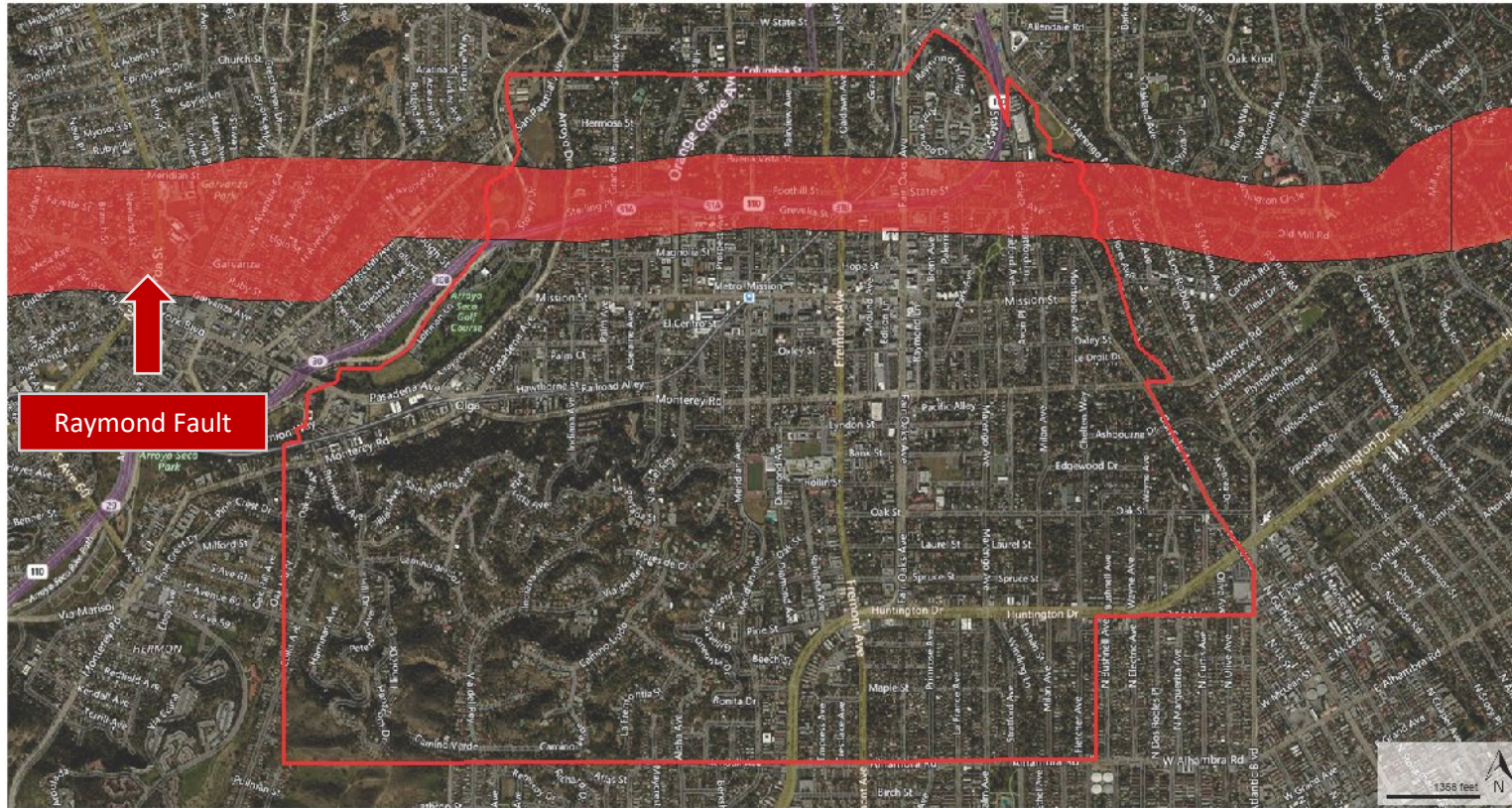




**DRAFT CITY OF SOUTH PASADENA DRAFT  
LOCAL HAZARD MITIGATION PLAN**

**SECTION FOUR**

**Exhibit 8 - Raymond Fault Map**



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Source: City of South Pasadena



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LOCAL HAZARD MITIGATION PLAN**

**SECTION FOUR**

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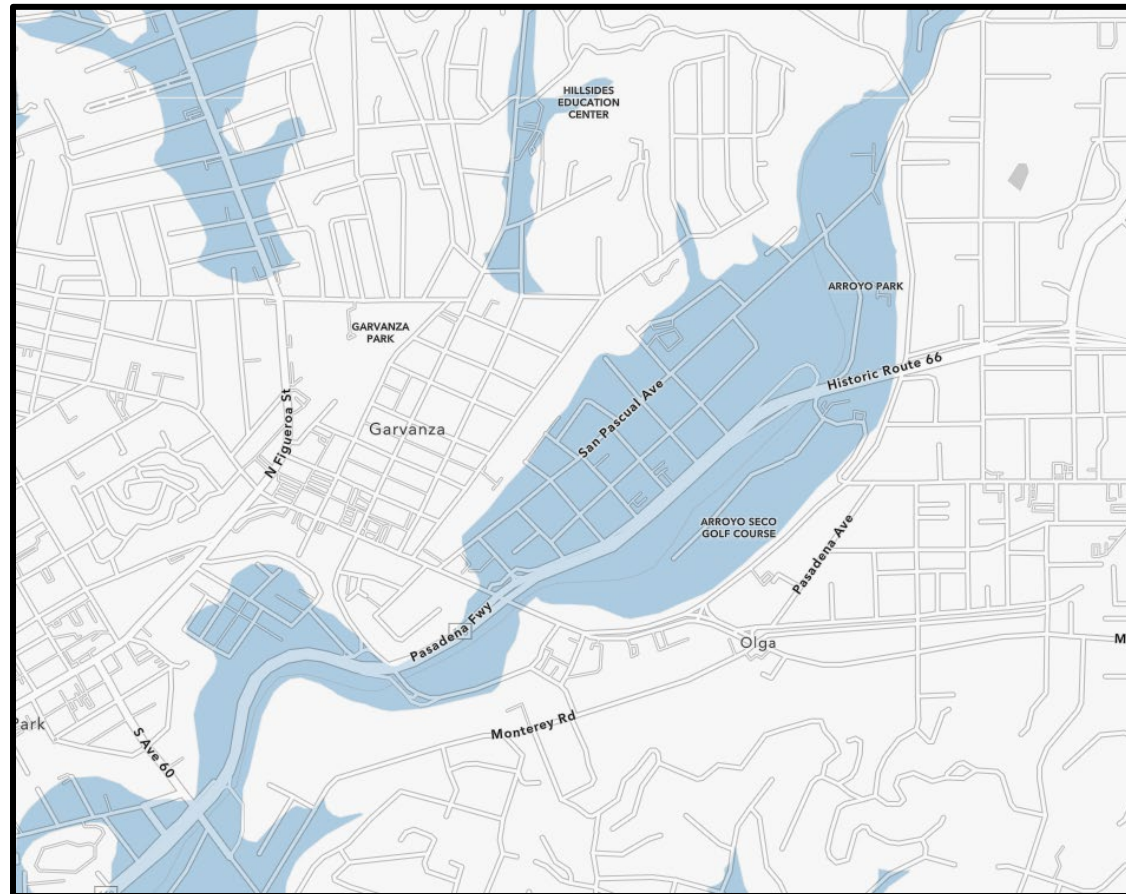
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## DRAFT CITY OF SOUTH PASADENA DRAFT LOCAL HAZARD MITIGATION PLAN

### SECTION FOUR

Exhibit 9 - Local Liquefaction Map



Source: County of Los Angeles Enterprise GIS at <https://egis-lacounty.hub.arcgis.com/datasets/lacounty::liquefaction-zones/explore?location=34.117611%2C-118.174063%2C14.39>





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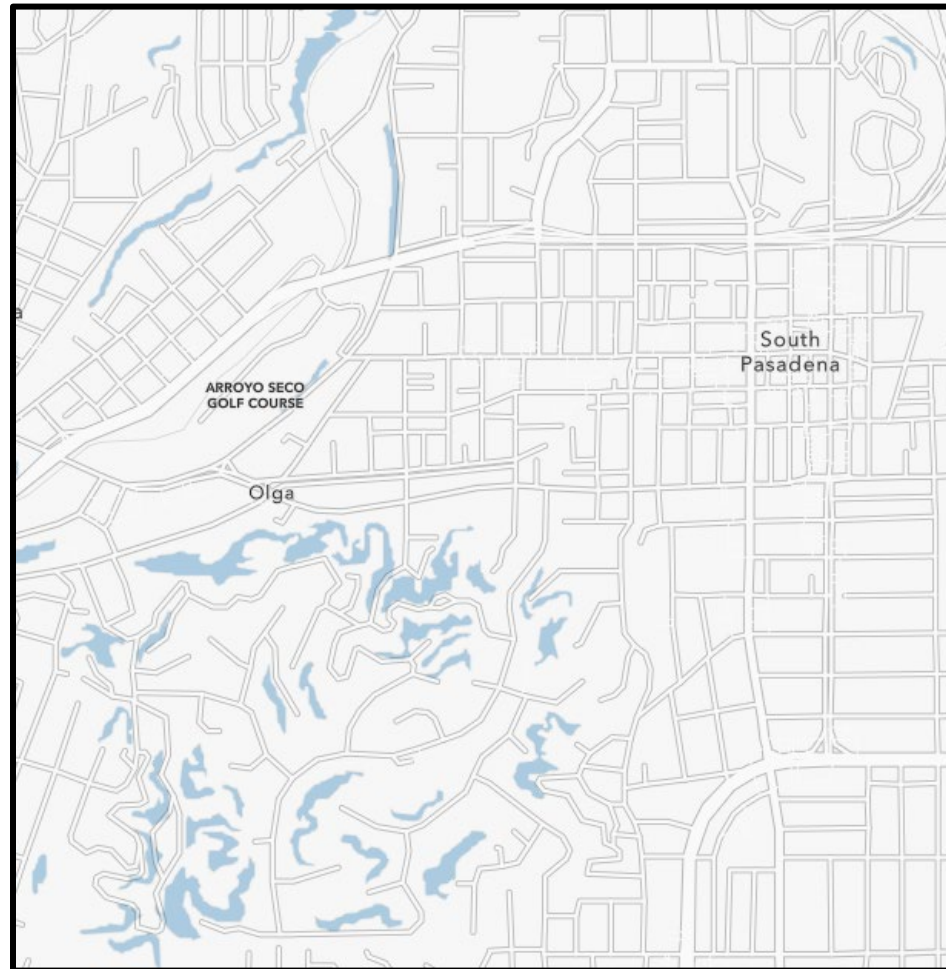
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**DRAFT CITY OF SOUTH PASADENA DRAFT  
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**Exhibit 10 - City of South Pasadena Potential Landslide Area Map**



Source: Los Angeles County Enterprise GIS at <https://egis-lacounty.hub.arcgis.com/datasets/lacounty::landslide-zones/explore?location=34.109591%2C-118.165406%2C13.76>



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## Extent

An earthquake's size and magnitude (M) are measured in various ways. Charles Richter first developed the Richter scale in the 1930s for measuring the size of earthquakes occurring in southern California using relatively high-frequency data from nearby seismograph stations. This magnitude scale was referred to as (ML), with the L for local. This is what was to become known as the Richter magnitude eventually.

Another scale, the Moment Magnitude Scale, measures the magnitude of medium and large-sized earthquakes by characterizing the amount of energy released by the earthquake. These include body wave magnitude (Mb) and surface wave magnitude (Ms). Each is valid for a particular frequency range and type of seismic signal. In its range of validity, each is equivalent to the Richter magnitude. The magnitude is based on the earthquake's seismic moment, which is equal to the rigidity of the Earth multiplied by the average amount of slip on the fault and the size of the area that slipped. (USGS, Glossary of Terms on Earthquake Maps)

The Modified Mercalli Intensity Scale measures ground shaking intensity in terms of perception and damage and considers localized earthquake effects. This scale is shown in **Table 15: Modified Mercalli Intensity Scale for Earthquakes**.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate surface faulting to structures for human occupancy. This state law resulted from the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard. The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides.

The State Department of Conservation operates the Seismic Mapping Program for California. Extensive information is available on their website: <http://gmw.consrv.ca.gov/shmp/index.htm>.

The **Richter Scale**, developed in the 1930s, provided a valuable measure of earthquake comparison. Another scale, the Moment Magnitude Scale, measures the magnitude of medium and large-sized earthquakes by characterizing the amount of energy released by the earthquake. The magnitude is based on the earthquake's seismic moment, which is equal to the rigidity of the Earth multiplied by the average amount of slip on the fault and the size of the area that slipped.

The **Moment Magnitude Scale** is now more widely used for scientific comparison since it accounts for the actual slip that generated the earthquake. Actual damage is due to the propagation of seismic or ground waves due to initial failure. The intensity of shaking is related to earthquake magnitude as it is to the condition of underlying materials. Loose materials tend to amplify ground waves, while hard rock can quickly attenuate them, causing minor damage to overlying structures. Refer to **Table 14**.

Another measurement tool, the **Modified Mercalli Intensity (MMI) Scale**, provides a practical qualitative assessment of ground shaking. The MMI Scale is a 12-point earthquake intensity scale based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale



describes a progressively more significant amount of damage at a given point of observation. The MMI Scale is shown in **Table 15**, along with relative ground velocity and acceleration.

A major earthquake along any regional fault system can produce strong ground shaking in the San Gabriel Valley. In addition, seismic risks associated with both regional fault systems and the local blind thrust faults underlying the area emphasize the need to ensure that all new development projects - and the retrofit of existing structures - incorporate appropriate design features to guard against widespread property damage and loss of life in the event of an earthquake.

**Table 14 - Moment Magnitude Scale for Earthquakes**

<b>Moment Magnitude (<math>M_w</math>)</b>	<b>Earthquake Effects</b>
Less than 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. It can cause significant damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause severe damage over larger areas.
Eight or greater	Great earthquake. Can cause severe damage in areas several hundred kilometers across.



**Table 15 - Modified Mercalli Intensity Scale for Earthquakes**

Intensity	Shaking	Description/Damage	Corresponding Richter Scale Magnitude
I	Not Felt	Not felt except by a very few under especially favorable conditions.	
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.	<4.2
III	Weak	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 are similar to the passing of a truck. Duration estimated.	
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing motor cars rocked noticeably.	
V	Moderate	Felt by nearly everyone; many awakened. Some dishes and windows broken. Unstable objects overturned. Pendulum clocks may stop.	<4.8
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.	<5.4
VII	Very Strong	Damage negligible in buildings of good design; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.	<6.1
VIII	Severe	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, and walls. Heavy furniture overturned.	
IX	Violent	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.	<6.9
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed, including their foundations. Rail traffic disrupted due to bent rails.	<7.3
XI	Extreme	Few, if any, masonry structures remain standing. Bridges destroyed. Rails bent greatly.	<8.1
XII	Extreme	Damage total. Lines of sight and level are distorted. Objects are thrown into the air.	>8.1

The California Geological Survey has identified areas most vulnerable to liquefaction. Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures. Southern California has many active landslide areas, and a large earthquake could trigger accelerated movement in these slide areas, in addition to jarring loose other unknown areas of landslide risk.



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### **Previous Occurrences**

The City of South Pasadena lies within a region with several active faults and therefore is subject to the risks and hazards associated with earthquakes. The most recent significant earthquake affecting Southern California was the January 17th, 1994, Northridge Earthquake. At 4:31 a.m., a moderate but very damaging earthquake with a magnitude of 6.7 struck the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures.

Fifty-seven people were killed, and more than 1,500 people were seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas, and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless.

66,500 buildings were inspected. Nearly 4,000 were severely damaged, and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but earthquake-triggered liquefaction and dozens of fires also caused additional severe damage. This extreme ground motion in large portions of Los Angeles County resulted in record economic losses.

However, the earthquake occurred early in the morning on a holiday. This circumstance considerably reduced the potential effects. Many collapsed buildings were unoccupied, and most businesses were not yet open. The direct and indirect economic losses ran into tens of billions of dollars. Like many neighboring cities, the City of South Pasadena felt the jolt of the Northridge Earthquake; fortunately, the city did not experience significant property damage or loss of life.

In addition to the Northridge Earthquake, historical and geological records show that California has a long history of seismic events. As noted earlier, Southern California is probably best known for the San Andreas Fault, the 400-mile-long fault running from the Mexican border to a point offshore, west of San Francisco. However, the San Andreas is only one of the dozens of known earthquake faults that crisscross Southern California. In addition to the other faults mentioned, some of the other known faults include the Newport-Inglewood, Chatsworth, Elsinore, Hollywood, Los Alamos, and Palos Verdes faults. Beyond the known faults, a potentially large number of “blind” faults underlie the surface of Southern California.

**Table 16** shows the most prominent Southern California earthquakes since 1980.



**Table 16 - Largest Southern California Earthquakes 1980 to 2022**

Date	Name	Mw	MMI	Deaths	Injuries	Loss
July 5, 2019	Ridgecrest	7.1 Mw	IX		5	\$5.3 B
July 4, 2019	Ridgecrest	6.4 Mw	VIII	1	20	\$5.3 B
March 28, 2014	La Habra	5.1 Mw	VI		Few	\$10.8 M
April 4, 2010	Baja California	7.2 Mw	VII	2 - 4	100 - 233	\$1.15 B
July 29, 2008	Chino Hills	5.4 Mw	VI		8	Limited
Dec. 22, 2003	San Simeon	6.6 Mw	VIII	2	40	\$250 - 300 M
Oct. 16, 1999	Hector Mine	7.1 Mw	VII		4	Limited
Jan. 17, 1994	Northridge	6.7 Mw	IX	57	8,700 +	\$13 - 40 B
June 28, 1992	Big Bear	6.5 Mw	VIII		63	More than 60 M
June 29, 1992	Landers	7.3 Mw	IX	3	400 +	\$92 M
April 22, 1992	Joshua Tree	6.3 Mw	VII		32	Light - Moderate
July 28, 1991	Sierra Madre	5.6 Mw	VII	2	100 - 107	\$34 - 40 M
Feb. 28, 1990	Upland	5.7 Mw	VII		30	\$12.7 M
Nov. 24, 1987	Elmore Ranch	6.5 Mw	VIII	2	90 +	
Nov. 23, 1987	Superstition Hills	6.1 Mw	VIII			\$3 M
Oct. 1, 1987	Whittier	5.9 Mw	VIII	8	200	\$213 - 358 M
July 21, 1986	Chalfant Valley	6.2 Mw	VI		2	\$2.7 M
July 13, 1986	Oceanside	5.8 Mw	VI		1	\$700 K
July 8, 1986	N. Palm Springs	6.0 Mw	VII		29 - 40	\$4.5 - 6 M

**Probability of Future Events**

According to the Southern California Earthquake Center (SCEC) document Putting Down Roots in California, the most comprehensive statewide analysis of earthquake probabilities determined the chance of having one or more magnitude 6.7 or larger earthquakes in California over the next 30 years is 99.7%. The fault with the highest probability of such earthquakes is the southern San Andreas, with 59% in the next 30 years. For powerful quakes of magnitude 7.5 or greater, there is a 37% chance that one or more will occur in the next 30 years in Southern California.

To clarify the extent of future earthquake risk, a partnership between the United States Geological Survey, California Geologic Survey, and Southern California Earthquake Center was formed to provide a uniform forecast. Known as the Working Group on California Earthquake Probabilities, this group evaluated and systemized currently available historic and paleoseismic information to produce a probabilistic seismic hazards analysis to indicate the type of future earthquakes. One product of this analysis is a method of





estimating the ground shaking is illustrated in **Table 17 - Most Likely Damaging Earthquake Scenarios**.

Refer to Shake Maps included in **Exhibit 11 - USGS Earthquake Shake Map - Southern San Andreas Fault**, **Exhibit 12 - USGS Earthquake Shake Map - Sierra Madre Fault**, **Exhibit 13 - USGS Earthquake Shake Map - Verdugo Fault**, and **Exhibit 14 - USGS Earthquake Shake Map – Raymond Fault** on the potential for damage based on Southern San Andreas, Verdugo, and Raymond Fault earthquakes as generated by the USGS.

**Table 17 - Most Likely Damaging Earthquake Scenarios**

<b>Earthquake Fault</b>	<b>30-year Probability</b>	<b>Potential Magnitud</b>
San Andreas	Significant	6.8 to 8
Sierra Madre	Moderate	6 to 7
Verdugo	Moderate	6 to 6.8
Elysian Park	Minimal	6 to 7
Raymond	Minimal	6 to 7

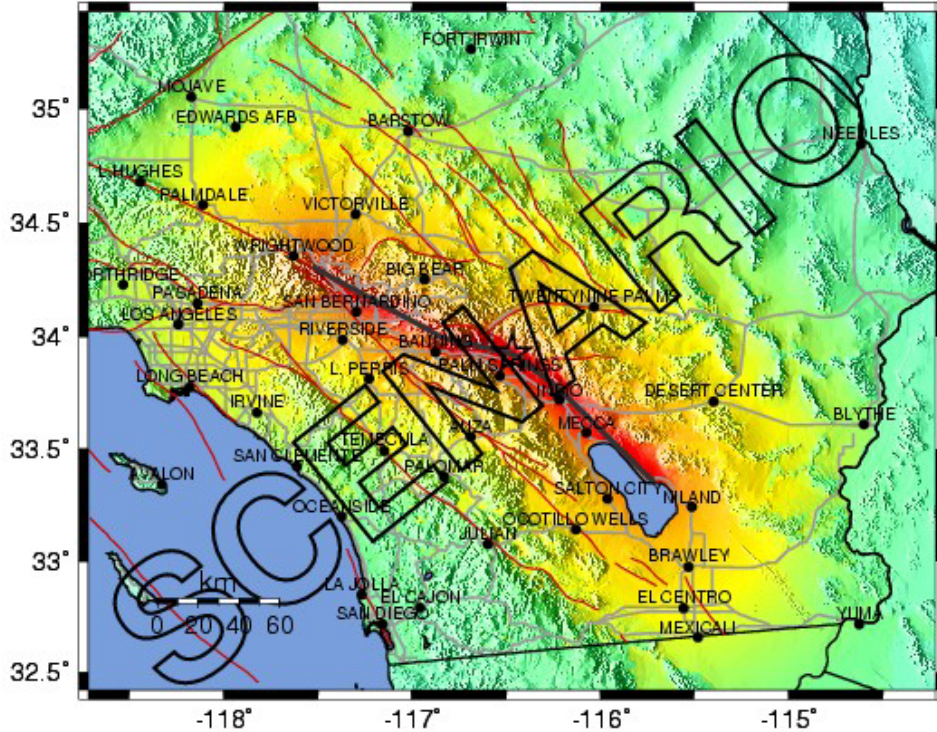


**Exhibit 11 - USGS Earthquake Shake Map - Southern San Andreas Fault**

-- Earthquake Planning Scenario --

Rapid Instrumental Intensity Map for San Andreas southern rupture Scenario

Scenario Date: Wed Nov 14, 2001 04:00:00 AM PST M 7.4 N33.92 W116.47 Depth: 10.0km

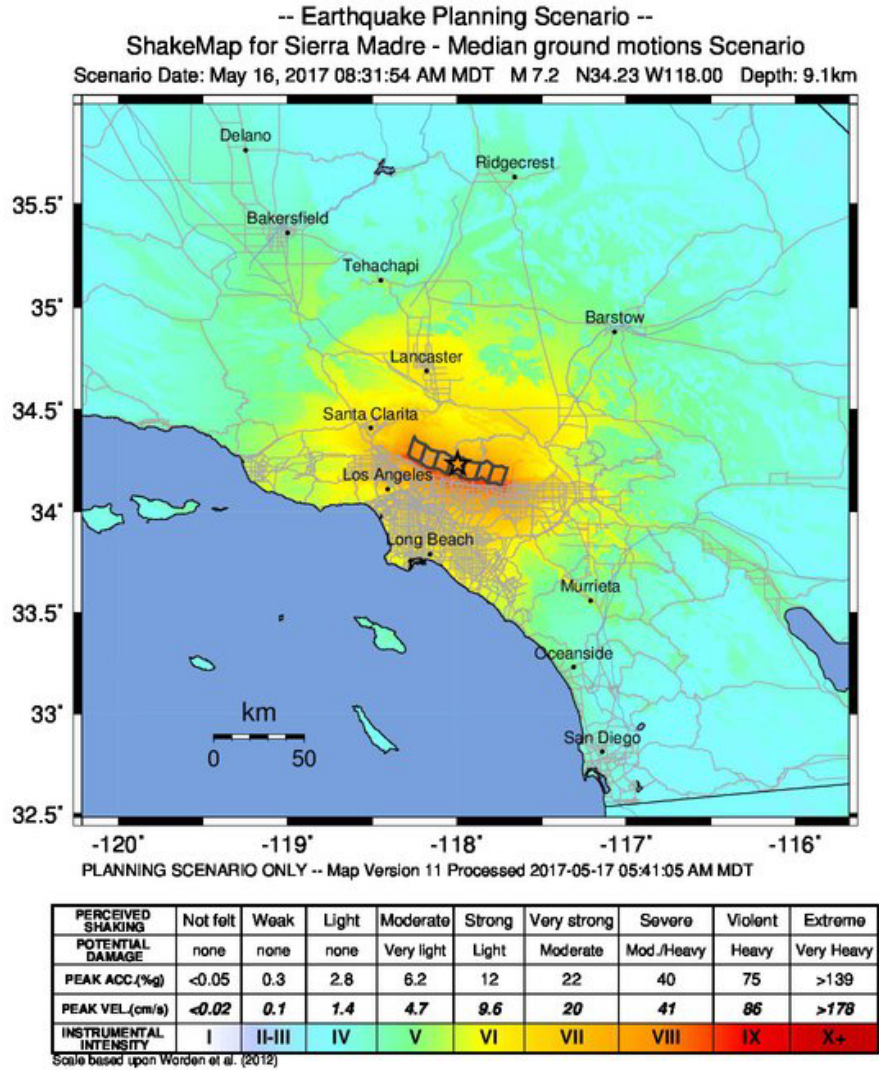


PLANNING SCENARIO ONLY -- Processed: Mon Jan 12, 2004 10:55:42 AM PST

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



**Exhibit 12 - USGS Earthquake Shake Map - Sierra Madre Fault**

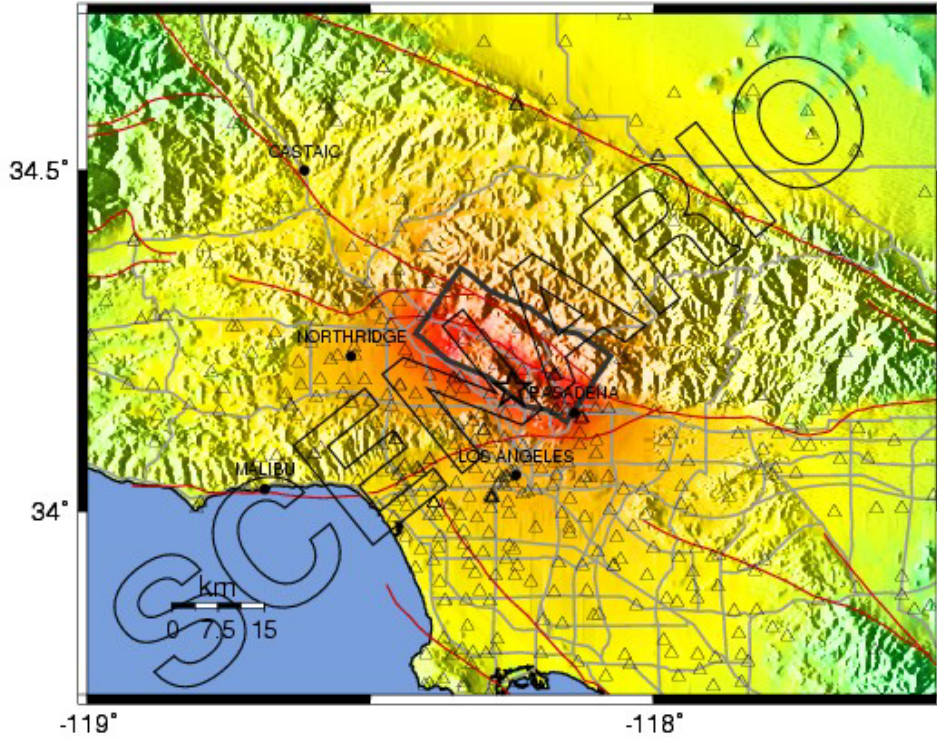






**Exhibit 13 - USGS Earthquake Shake Map - Verdugo Fault**

-- Earthquake Planning Scenario --  
 Rapid Instrumental Intensity Map for Verdugo Fault M6.7 Scenario  
 Scenario Date: Tue Oct 30, 2001 04:00:00 AM PST M 6.7 N34.18 W118.25 Depth: 6.0km



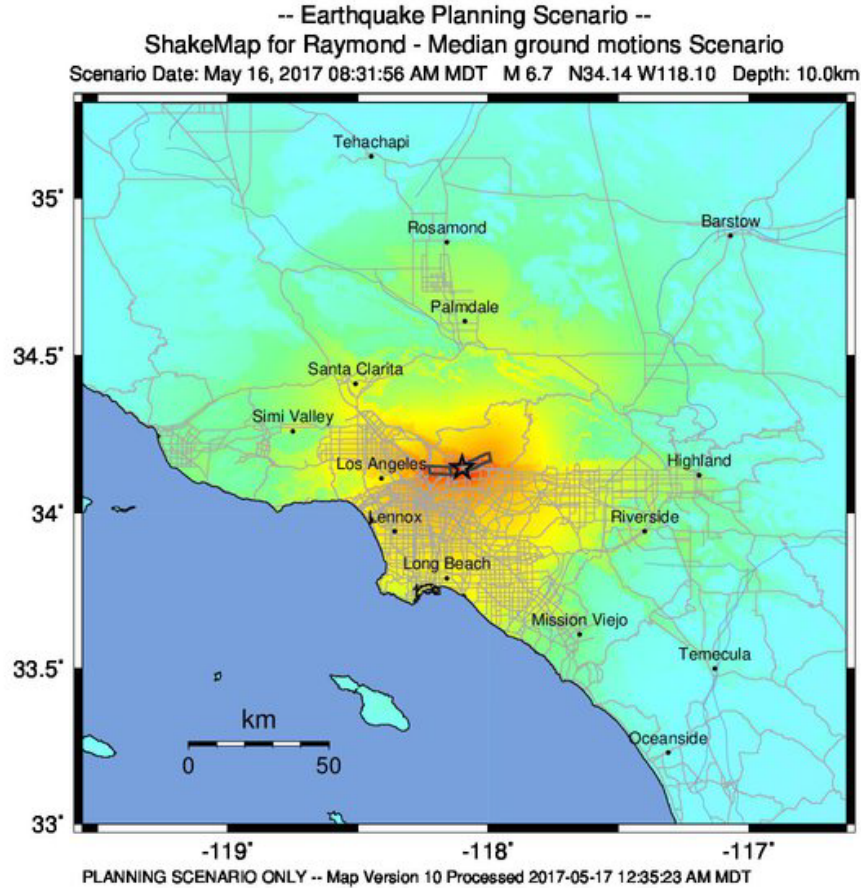
PLANNING SCENARIO ONLY -- Processed: Wed Jul 7, 2004 11:01:41 PM PDT

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+





**Exhibit 15 - USGS Earthquake Shake Map - Raymond Fault**



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

Scale based upon Worden et al. (2012)



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## **Impacts**

A large Earthquake would significantly impact the City of South Pasadena. The loss of human life and significant injuries remain a major consequence of an earthquake due to the potential of building collapses, roadway overpasses dropping, falling items and debris, and glass breakage.

With the potential of Landslides in the Monterey Hills area, a landslide could flatten or destroy houses resulting in added injuries or loss of life in the City. Liquefaction zones in the Arroyo and Monterey Hills areas also have the potential for building damage.

A significant Earthquake could also cause commercial and residential fires by severing internal gas lines. In the downtown area, it may be difficult to stop the spread of the fire, and this, in turn, would lead to extensive damage.

The City's utility system could also see major damage, with broken water and sewer lines, downed electrical lines, and ruptured gas lines. Damage such as this could create transportation delays along Fair Oaks Avenue, Huntington Drive, Mission Street, and Monterey Road. Damage to State Route 110 could result in traffic diverting onto City streets, causing further delays.

Lastly, a major earthquake would deplete City services to a point where mutual aid would need to be called in to help the City respond to and recover from such an event.

## **Vulnerability**

This Plan has already established that South Pasadena lies within a region with several active faults and therefore is subject to the risks and hazards associated with earthquakes. **Exhibit 7 - Local Earthquake Faults and Probabilities** shows the geographic relationship of the city to surrounding active and potentially active faults. As mentioned earlier, the Raymond Fault has been identified as being within city limits. Any of these earthquake faults are a hazard risk to the city.

## **Climate Change Considerations**

As climate change occurs, it is anticipated that changes to precipitation regimes and hydrological patterns will result. Since liquefaction depends on shallow subsurface water, increased groundwater levels could occur due to increased precipitation. The potential increase in shallow subsurface water conditions could expand the potential liquefiable areas within the city, increasing the risk of future damage to structures.





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## **4.2 Severe Storms and Localized Flooding**

### **Identifying Flooding Hazards**

Flooding and severe storms present similar risks and are usually related types of hazards in South Pasadena. Severe storms can cause high winds, hill erosion, debris flows, and flooding.

Severe storms are usually generated in the Pacific Ocean. As they rise over the mountain and ridges that border the eastern boundaries of Los Angeles County, the air associated with these storms cools, resulting in large amounts of precipitation. The topography of the County provides relatively steep and well-defined watershed areas to funnel the falling rain into runoff tributaries. Periods of heavy rainfall are expected during the fall and winter months.

During a flood, excess water from rainfall overflows into storm drains and creeks. Several factors determine the severity of floods, including rainfall intensity and duration, creek and storm drain system capacity, and the infiltration rate of the ground.

A flood occurs when a storm drain or waterway receives a discharge greater than its conveyance capacity. Floods may result from intense rainfall, localized drainage problems, or failure of flood control or water supply structures such as culverts, levees, dams, or reservoirs. Floods usually occur in relation to precipitation. Flood severity is determined by the quantity and rate at which water enters the waterway, increasing the volume and velocity of water flow. The rate of surface runoff, the major component of flood severity, is influenced by the region's topography and the extent to which ground soil allows for infiltration, in addition to the percentage of impervious surfaces.

Floodwaters can carry large objects downstream with force strong enough to destroy stationary structures such as homes and bridges and break utility lines. Floodwaters also saturate materials and the earth resulting in the instability, collapse, and destruction of structures and the loss of human life.

Two types of flooding may affect the area: riverine flooding and urban flooding (see descriptions below). In addition, any low-lying area has the potential to flood. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a stormwater system's capability to remove it.

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams that drain into the major rivers. Shallow area flooding is a particular type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by a 100-year flood with flood depths of only one to three feet. Low-velocity sheet flows of water generally flood these areas.





Urban Flooding is a concern as land is converted from fields or woodlands to roads and parking lots and 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 much faster in urban areas. Adding these elements to the hydrological systems can result in flood waters that rise rapidly and peak with violent force.

South Pasadena has a high concentration of impervious surfaces that either collect or concentrate water flow in unnatural channels. During periods of urban flooding, streets can become swift-moving rivers, and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

### **Location**

Flooding occurs when climate, geology, and hydrology combine to create conditions where water flows outside its usual course. In South Pasadena, geography and climate combine to create seasonal flooding conditions, especially in the city's older sections where older storm drains can no longer carry the water generated by Severe Storms.

The greater Los Angeles Basin has been the product of rainstorms and erosion for millennia. Most of the mountains that ring the valleys and coastal plain are deeply fractured faults, and as they (the mountains) grew taller, their brittle slopes were continually eroded. Rivers and streams carried boulders, rocks, gravel, sand, and silt down these slopes to the valleys and coastal plain. In places, these sediments are as much as twenty thousand feet thick.

Many portions of Los Angeles County, including the San Gabriel Valley, are built for all intents and purposes. This leaves precious little open land to absorb rainfall. The lack of open ground forces water to remain on the surface and rapidly accumulate. Flooding would be much more common if not for the massive flood control system with its concrete-lined river and stream beds. And the tendency is towards even less and less open land. In-fill building is becoming a much more common practice in many areas. Developers tear down an older home, which typically covers up to 40% of the lot size, and replace it with three or four townhomes or apartments that may cover 90-95% of the lot.

Another potential source of flooding is "asphalt creep." The street space between the curbs of a street is a part of the flood control system. Water leaves the property and accumulates in the streets, where it is directed toward 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.

### **Extent**

As part of the National Flood Insurance Program (NFIP), floodplain studies have been conducted for various communities in Los Angeles County, including the City of South Pasadena. The results of these studies are presented on Flood Insurance Rate Maps (FIRM), which identify 100 and 500-year floodplain boundaries. The City of South Pasadena is located on Panel No. 0650671 of the FIRM maps. The entire city is located within Zone C, which designates areas of minimal flooding. As there are no floodplain areas



within the city, and there are no pertinent large-scale flood hazards. Because of this, the City of South Pasadena does not participate in the NFIP as it has been designated as a No Special Flood Hazard Area (NSFHA). Refer to <https://www.fema.gov/cis/CA.html>.

**Past Occurrences**

Severe storms that cause flooding have occurred numerous times over the years. In the last 125 years, the average annual rainfall in Los Angeles County has been 14.9 inches. But the term “average” means very little as the annual rainfall during this period has ranged from only 4.35 inches in 2001-2002 to 38.2 inches in 1883-1884. In fact, in only fifteen of the past 125 years, the annual rainfall has been within plus or minus 10% of the 14.9-inch average. In only 38 years, the annual rainfall has been within plus or minus 20% of the 14.9-inch average. This makes the Los Angeles basin a land of extremes in terms of annual precipitation. The City of South Pasadena is in the western region of the San Gabriel Valley. It is close to the San Gabriel Mountains, which increases rainwater collection. Refer to **Table 18 - Historical Severe Storm and Flooding Events in Los Angeles County**

**Table 18 - Historical Severe Storm / Flooding Events in Los Angeles County**

Year	Event
1825	L.A. River changed its course back from the Ballona wetlands to San Pedro
1832	Heavy flooding
1861-62	Heavy flooding. Fifty inches of rain falls during December and January.
1867	Floods create a large, temporary lake out to Ballona Creek.
1876	The Novician Deluge
1884	Heavy flooding causes the river to change, turning east to Vernon and southward to San Pedro.
1914	Heavy flooding. Great damage to the harbor.
1934	Moderate flood starting January 1. Forty dead in La Canada.
1938	Great County-wide flood with four days of rain. Most of the rain on day 4.
1941-44	L.A. River floods five times.
1952	Moderate flooding
1969	One heavy flood after a nine-day storm. One moderate flood.
1978	Two moderate floods
1979	Los Angeles experiences severe flooding and mudslides.
1980	Flood tops banks of a river in Long Beach. Sepulveda Basin spillway almost opened.
1983	Flooding kills six people.
1992	15-year flood. Motorists trapped in Sepulveda basin. Six people dead.
1994	Heavy flooding



Table 18 - Historical Severe Storm / Flooding Events in Los Angeles County (Continued)

Year	Event
2005	First large flood in Los Angeles County since 1938. It centered in communities near the Los Angeles River or near creeks connected to the Los Angeles River. Three people were killed.
2009	Intense rainfall on mountain slopes denuded by the Station Fire triggered mud, rock, and boulders to flow into a hillside community in La Canada Flintridge.
2010	A series of powerful Pacific winter storms fueled by El Nino conditions pounded Los Angeles County and leashed mud and debris flows that prompted evacuations, flooded businesses, and downed trees and power lines.
2013	Heavy thunderstorms developed in the high desert. Radar estimated rainfall west of Victorville at seven inches.
2015	A severe storm swept through Southern California, causing mudslides to close portions of Interstate 5 and Hwy 58 near Mojave.
2018	Marine layer clouds brought drizzle and dense fog to the Cajon Pass, reducing visibilities on Interstate 5. A 30-vehicle crash occurred, and 21 people were injured.

**Probability of Future Events**

Severe storms will always continue to occur in Southern California. Anecdotal information reveals that South Pasadena experiences one large storm every two to three years. This equates to a 33% to 66% chance of a large storm occurring within the city in a given year.

**Impacts**

The greatest Flooding issue in South Pasadena is related to the City’s storm drain infrastructure and its inability to handle significant amounts of rainfall during Severe Storms. Water will flood the roadways and surrounding properties, causing traffic disruption and the possibility of property damage to businesses and residences. Associated property damage could lead to claims against the City and the possibility of financial losses. The City of South Pasadena is addressing this issue by updating its storm drain system over the next five years in an attempt to mitigate localized flooding

**Vulnerability**

In general, flood hazard identification is the first phase of hazard assessment. Identification is the process of estimating: (1) the geographic extent of the floodplain (i.e., the area at risk from flooding); (2) the intensity of the flooding that can be expected in specific areas of the floodplain; and (3) the probability of occurrence of flood events. This process usually results in the creation of a floodplain map. Floodplain maps provide detailed information that can assist jurisdictions in making policies and land-use decisions. This phase is not pertinent to the City of South Pasadena.



Vulnerability assessment is the second step of flood-hazard assessment. It combines the floodplain boundary, generated through hazard identification, with an inventory of the property within the floodplain. Understanding the population and property exposed to natural hazards will assist in reducing risk and preventing loss from future events. Flooding events in South Pasadena will be localized due to urban flooding issues.

Risk analysis is the third and most advanced phase of a hazard assessment. It builds upon hazard identification and vulnerability assessment. A flood risk analysis for the City of South Pasadena should include two components: (1) the life and value of a property that may incur losses from a localized flood event (defined through the vulnerability assessment); and (2) the number and type of flood events expected to occur over time. Within the broad components of risk analysis, it is possible to predict the severity of damage from a range of events.

The data used to develop these models is based on hydrological analysis of landscape features. Changes in the landscape, often associated with human development, can alter the flow velocity and the severity of damage expected from a localized flood event.

It is possible that damage can be expected from localized flood events over time. It is also possible to pinpoint the effects of certain flood events on individual properties. In the future, updated mapping projects will result in better data that will assist in understanding specific flooding risks.

### **Climate Change Considerations**

According to the Scripps Institution of Oceanography, the last two decades underscore California's strong propensity for wet and dry periods, with a string of multi-year droughts punctuated by a few spectacular wet years. Scripps downscaled global models indicate that, by the mid-21st century, California's dry years may become drier, wet years occasionally becoming wetter. On top of its already volatile hydroclimate, these precipitation and drought extremes would exacerbate other climate problems confronting the state, both flood- and drought-related.

Two key climate change signals in the hydroclimate of California have been identified: progressively less frequent precipitation, particularly in the fall and spring, and greater precipitation extremes. Although these signals tend to cancel each other out in the annual mean precipitation, they exacerbate the natural volatility of the region's hydroclimate by increasing reliance on the most significant storms of the year to make up the annual total precipitation.

In Southern California, the ups and downs of the annual water supply are dictated by the presence or absence of a few large winter storms. In most cases, these extremely wet storms come in the form of long, narrow water vapor bands known as atmospheric rivers (ARs). ARs are the source of the West Coast's heaviest rains. ARs are both a hazard and a benefit – they cause most of the West Coast's floods, but they deliver the majority of their rain and snow that is vital for the region's water supply. Like hurricanes, atmospheric rivers become more damaging the stronger they are. Scripps researchers found that these storms pose a \$1 billion-a-year flood risk in the West. Scientists expect that atmospheric rivers will become an even more significant flood risk as global warming trends increase their intensity.



### 4.3 Landslides and Mudflow

#### Identifying Landslide and Mudflow Hazards

General slope stability is determined by many factors, such as the angle of the slope, vegetative cover, wildland fire, bedrock, soil, seismic activity, precipitation, groundwater, erosion, and human alterations to land, such as hillside grading activities. Slopes may be in temporary equilibrium until one of the factors above is modified by natural or human activity resulting in an unstable condition and potential slope failure.

A landslide is a downward and outward movement of soil and rock. Such a movement occurs when steep slopes are destabilized by excess water accumulation in the soil, the addition of excess weight to the top of a slope, the removal of support from the bottom of a slope, or a combination of the above. The force of rocks, soils, or other debris moving down a slope can devastate anything in its path.

Mudflows, often referred to as "debris flows" or "mudslides," are caused by sustained and intense rainfall accompanied by rocks, vegetation, and other debris. These are fast-moving slope flows and can cause severe damage. The rapid movement and sudden arrival of debris flows pose a hazard to life and property during and immediately following the triggering rainfall. To trigger "debris flows," a storm must have a critical combination of rainfall intensity and duration, leading to saturation of the hill slope soils, generation of positive pore fluid pressures within the soil, and, ultimately, slope failure.

#### Location

The areas in the City of South Pasadena that are susceptible to Landslides due to severe storms and flooding are the same areas that could be affected by an Earthquake, namely the Monterey Hills neighborhood and the areas surrounding the below-ground section of State Route 110. Refer to **Exhibit 10 - City of South Pasadena Potential Landslide Area Map**.

#### Extent

Although landslides can threaten South Pasadena, they are a severe geologic hazard in almost every state and many cities in America. Nationally, landslides cause 25 to 50 deaths each year. The best estimate of direct and indirect costs of landslide damage in the United States ranges between \$1 and \$2 billion annually. As a seismically active region, California has had a significant number of locations impacted by landslides. Some landslides damage private property, and other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life. Slow-moving landslides can cause significant property damage but are less likely to result in serious human injuries.



Past Occurrences

There have been no significant occurrences of Landslides in the City, although minor mudflows have been reported in the Monterey Hills neighborhood following Severe Storms. **Table 19 - Regional Landslides and Mudflows** identifies past landslide and mudflow events in and around Los Angeles County.

Table 19 - Regional Landslides and Mudflows

Date	Location	Type	Damage
1983	Southern California	Landslides	Over 1 Billion Dollars in Damage
1983	San Clemente	Landslide	Highway 1 Damaged
1983	Big Rock Mesa	Landslide	13 Homes Destroyed
1994	Los Angeles County (Northridge Earthquake)	Landslides	11,000 Landslides Valley Fever Outbreak
1995	Ventura and Malibu	Landslides	Numerous Homes Destroyed Many Deaths Resulted
2018	Montecito (Santa Barbara County)	Mudslides	Numerous Homes Destroyed Many Deaths Resulted

Probability of Future Events

According to the Los Angeles County Safety Element, landslide areas exist throughout the region. As stated, the Monterey Hills area in the southwest portion of the city could be a particular area of concern. Although small in geographic size compared to the rest of the County, the area has the potential for a sizeable disastrous event for the City.

Impacts

During an Earthquake or Severe Storm, a significant Landslide in the Monterey Hills neighborhood could cause homes to slide down the hills onto other homes or roadways. If the homes were occupied, there would be a considerable risk of injury or death to the occupants. In addition, roadways could slide away, hampering rescue operations and creating long-term traffic issues. Dollar amounts to rebuild homes (if possible) and rebuild public roadways would be enormous to both the City and homeowners.

Along the below-ground section of State Route 110, a landslide onto the highway could force the detouring of traffic onto surface streets, causing significant congestion on the City’s arterial roadways. There would also be financial impacts to the State of California to repair the roadway and surrounding areas to open it back up for vehicular traffic.



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## **Vulnerability**

Vulnerability assessment for landslides will assist in predicting how different types of property and population groups will be affected by a hazard. Data that includes specific landslide-prone and debris flow locations in the city can be used to assess the population and total value of the property at risk from future landslide occurrences. Factors in assessing landslide risk include population and property distribution in the hazard area, the frequency of landslide or debris flow occurrences, slope steepness, soil characteristics, and precipitation intensity.

The potential for slope failure is dependent on many factors and their interrelationships. Some of the most critical factors include slope height, steepness, shear strength, the orientation of weak layers in the underlying geologic unit, and pore water pressures. Joints and shears, which weaken the rock fabric, allow water penetration, leading to deeper weathering of the rock along with increasing the pore pressures, the plasticity of weak clays, and the weight of the landmass.

Natural slopes, graded slopes, or graded/natural slope combinations must meet these minimum engineering standards where they impact planned homes, subdivisions, or other types of developments. In general, slopes adjacent to areas where the risk of economic losses from landslides is small are often allowed a lesser factor of safety.

While a quantitative vulnerability assessment (an assessment that describes the number of lives or amount of property exposed to the hazard) has not yet been conducted for the City of South Pasadena landslide events, many qualitative factors point to potential vulnerability. As mentioned, landslides can impact roadways, blocking residents from essential services and businesses.

## **Climate Change Considerations**

Anticipating that precipitation regimes may change in the future due to climate change, there may be greater opportunity for landslides and mudflows. Current climate change science indicates that storms may become less frequent and more intense, resulting in greater runoff at higher velocities within the various drainages in South Pasadena. With greater amounts of precipitation, underlying soils and rock units could become saturated quicker, increasing the risk of landslides. In addition, if water runoff occurs at greater velocities, there is a more significant potential for erosion, which could induce landslides and mudflows within the city.



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## **4.4 Wildland and Urban Fires**

### **Identifying Wildland and Urban Fire Hazards**

Fire hazards threaten lives, property, and natural resources and present a considerable risk to vegetation and wildlife habitats. Fires occur in wildland and urban areas. A wildfire is an uncontrolled fire spreading through vegetative fuels. Wildfires can be caused by human error (such as campfires), intentionally by arson, by mechanical sources of ignition (such as heaters and generators), and by natural events (such as lightning). Wildfires often occur in forests or other areas with ample vegetation. In areas where structures and other human development meets or intermingles with wildland or vegetative fuels (referred to as the “wildland-urban interface”), wildfires can cause significant property damage and present extreme threats to public health and safety.

Urban fires usually result from sources within structures and are generally related to specific sites and structures. The availability of firefighting services is essential to minimize losses that result from a fire. Effective fire protection in urban areas is based upon several factors, such as structure age, circulation routes' efficiency (ultimately affecting response times), and availability of water resources to combat fires.

There are three categories of interface fire: The classic wildland/urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas; isolated homes characterize the mixed wildland/urban interface, subdivisions and small communities situated predominantly in wildland settings; and the occluded wildland/urban interface exists where islands of wildland vegetation occur inside a primarily urbanized area. Certain conditions must be present for significant interface fires to occur. The most common conditions include hot, dry, and windy weather; the inability of fire protection forces to contain or suppress the fire; multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel topography, weather, drought, and development.

### **Location**

Southern California has two distinct areas of risk for wildland fire. The foothills and lower mountain areas are most often covered with scrub brush or chaparral. The higher elevations of mountains also have heavily forested terrain. The lower elevations covered with chaparral create one type of exposure.

One challenge Southern California faces regarding the wildfire hazard is the increasing number of houses built on the urban/wildland interface. Every year the growing population has expanded further into the hills and mountains, including forest lands. The increased “interface” between urban/suburban areas and the open spaces created by this expansion has significantly increased threats to life and property from fires. It has pushed existing fire protection systems beyond their original or current design and capability. Property owners in the interface are unaware of their problems and threats. Therefore, many owners have done little to manage or offset fire hazards or risks on their property. Furthermore, human activities increase the incidence of fire ignition and potential damage.



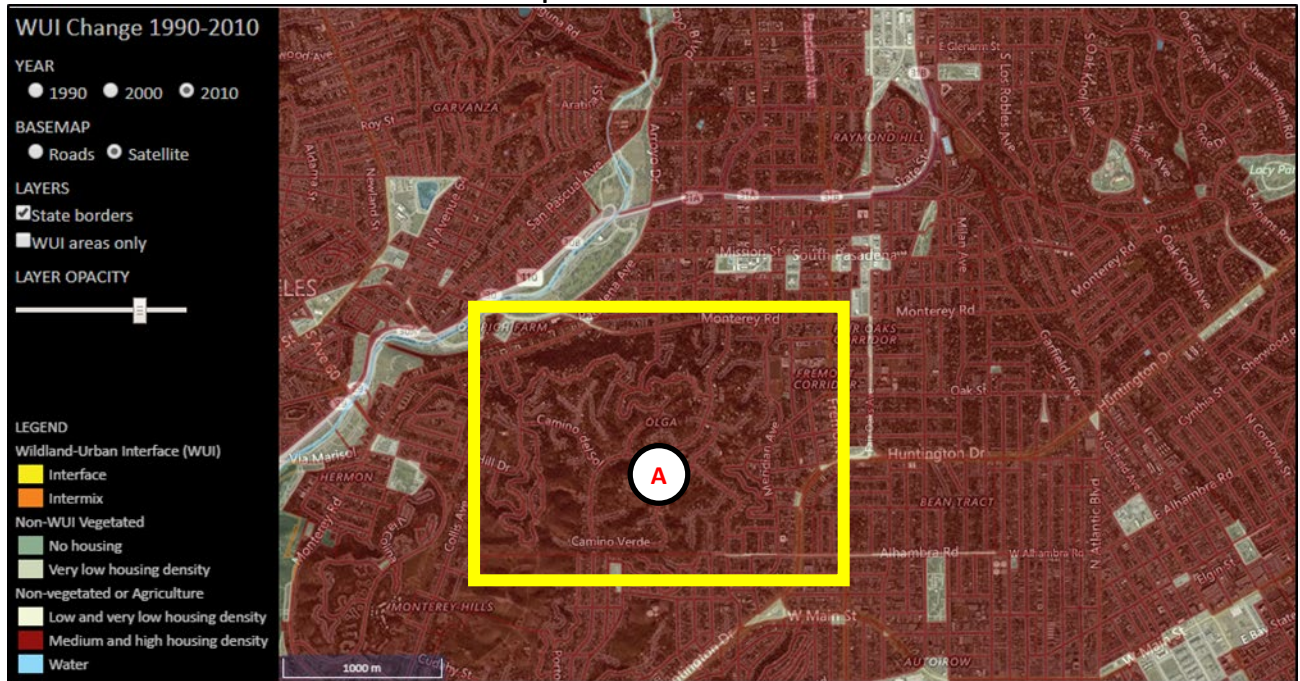


Topography influences the movement of air, thereby directing a fire course. For example, if the percentage of uphill slope doubles, the rate of spread in wildfire will likely double. Gulches and canyons can funnel air and act as chimneys, which intensify fire behavior and cause the fire to spread faster. Solar heating of dry, south-facing slopes produces upslope drafts that can complicate fire behavior. Unfortunately, hillsides with hazardous topographic characteristics are also desirable residential areas in many communities. This underscores the need for wildfire hazard mitigation and increased education and outreach to homeowners living in interface areas.

Weather patterns combined with specific geographic locations can create a favorable climate for wildfire activity. Areas, where annual precipitation is less than 30 inches per year are extremely fire-susceptible. High-risk areas in Southern California share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. The so-called “Santa Ana” winds, which are heated by compression as they flow down to Southern California from Utah, create an exceptionally high risk, as they can rapidly spread what might otherwise be a small fire.

Several areas in the City of South Pasadena have been identified as potential areas for urban interface brush fires. These areas are moderate in size ranging from several acres to dozens of acres in size. Most of these identified areas are covered in light to moderate brush with topography ranging from gradual hillsides to very steep hillsides. The fire department assessed the areas identified by utilizing pre-fire planning, which accounts for access, water supply, and strategic, operational planning. Refer to **Exhibit 16 - Map of Wildland - Urban Interface** indicates the Monterey Hills area of South Pasadena. It is highlighted in yellow on the lower left side of the map. In 1984, in the area marked as “A,” a 5-acre fire broke out in the area of Via del Ray. There has been little to no change since the map was developed in 2010.

Exhibit 16 - Map of Wildland - Urban Interface



Source: City of South Pasadena



**Extent**

CalFire tracks Wildland Fires to provide a snapshot of the number of fires and acres burned. These are numbers taken from their Computer Aided Dispatch (CAD) system and the National Incident Management Situation Report. These are good ways to track the number and locations of Wildland Fires Statewide. These fires range from minor incidents to large, multi-jurisdictional incidents. Lives lost, Acres burned, and property damaged are all indicators of a fire’s size and complexity. Refer to **Table 20 - California Wildland Fires January to September 2022**

**Table 20 - California Wildland Fires January to September 2022**

California Wildland Fires January to January 2023			
Fire Name	Acres Burned	Start Date	Notes
Airport Fire	4,136	February 16, 2022	Unknown cause
Coastal Fire	200	May 11, 2022	Burned into a neighborhood and destroyed 20 homes
Lost Lake Fire	5,856	May 26, 2022	Unknown cause
Thunder Fire	2,500	June 22, 2022	Likely caused by a lightning strike
Roblar Fire	63	June 27, 2022	Unknown cause; one fatality after being trapped in a vehicle
Electra Fire	4,478	July 4, 2022	Unknown cause, possibly fireworks celebrations
Washburn Fire	4,886	July 7, 2022	Human-caused, forced evacuations in Wawona and trail closures in Yosemite National Park; threatened Mariposa Grove
Oak Fire	19,244	July 22, 2022	Unknown cause forced evacuations in Mariposa County. Destroyed 182 structures and damaged ten structures
McKinney Fire	60,138	July 29, 2022	Possibly caused by power lines; destroyed 185 structures, and caused four fatalities
Yeti Fire	7,886	July 29, 2022	Probable lightning-caused, forced evacuations in Siskiyou County, originally named the China 2 fire
Summit Fire	1,394	August 3, 2022	Caused by lightning, being suppressed using indirect methods, burning in southern Sequoia National Park
Red Fire	8,364	August 4, 2022	Lightning caused burning in Yosemite National Park, not being entirely suppressed due to natural barriers
Six Rivers Lightning Complex	41,596	August 5, 2022	Caused mandatory evacuations in Trinity and Humboldt counties, composed of multiple lightning fires that eventually merged into the Campbell Fire and Ammon Fire
Rodgers Fire	2,790	August 8, 2022	Lightning caused burning in Yosemite National Park, not being entirely suppressed due to natural barriers



**Table 20 - California Wildland Fires January to September 2022 (Continued)**

<b>Fire Name</b>	<b>Acres Burned</b>	<b>Start Date</b>	<b>Notes</b>
Route Fire	5,208	August 31, 2022	Burned near Interstate 5 and Castaic Lake, one structure destroyed and seven firefighters injured
Border 32 Fire	4,456	August 31, 2022	Burned near U.S./Mexico border, ten structures destroyed
Mountain Fire	13,440	September 2, 2022	Burned seven miles SW of Gazelle, four structures destroyed
Mill Fire	3,935	September 2, 2022	Burned in/near communities of Weed and Lake Shastina, destroyed 118 structures, caused two fatalities
Radford Fire	1.079	September 2, 2022	Burning near Big Bear Lake, has caused evacuations in the region
Fairview Fire	28,307	September 5, 2022	Burning near Hemet, caused two fatalities and destroyed 36 structures
Mosquito Fire	76,788	September 6, 2022	Burning near Foresthill, has caused evacuations in Placer and El Dorado County. 78 structures destroyed
Fork Fire	819	September 7, 2022	Caused by a vehicle, destroyed 43 structures near North Fork
Barnes Fire	5843	September 7, 2022	Caused by lightning, burned near Fort Bidwell in the Warner Mountains

**Past Occurrences**

A sizeable urban fire occurred in 1895 in South Pasadena at the historic Raymond Hotel. On November 17, 1886, the magnificent 400-room Hotel Raymond was formally opened. The hotel was a large frame structure costing \$400,000 at the time, construction on which had been started in 1884. On Easter Sunday, 1895, a spark from a chimney set the roof on fire, and the hotel and all its contents burned to the ground in 40 minutes. At the time, 165 guests were staying at the hotel, but most were at church. As fortune would have it, no one was hurt, though all their possessions were lost. Nothing was left standing but the chimney. In 1984, in the area known Monterey Hills, a five-acre fire broke out in the area of Via del Ray. It was contained by the South Pasadena Fire Department and mutual aid fire agencies. A large area of vegetation burned, and some homes were damaged.

**Figure 6 - Raymond Hotel - Before, During, and After Fire**



Source: City of South Pasadena Library



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## **Probability of Future Events**

Southern California's hills and mountainous areas are considered interface areas. The development of homes and other structures is encroaching onto the wildland and is expanding the wildland/urban interface, creating the probability of increased Wildland Fires. The interface neighborhoods are characterized by various housing structures, development patterns, ornamental and natural vegetation, and natural fuels.

In a wildfire, vegetation, structures, and other flammables can merge into unwieldy and unpredictable events. Factors critical to fighting such fires include access, firebreaks, the proximity of water sources, distance from a fire station, and available firefighting personnel and equipment. Reviewing past wildland/urban interface fires shows that many structures are destroyed or damaged for one or more of the following reasons:

- Combustible roofing material;
- Wood construction;
- Structures with no defensible space;
- Fire department with poor access to structures;
- Subdivisions located in heavy natural fuel types;
- Structures located on steep slopes covered with flammable vegetation;
- Limited water supply; and
- Winds over 30 miles per hour.

Continued development into the interface areas will significantly impact the wildland/urban interface. Periodically, the historical losses from wildfires in Southern California have been catastrophic, with deadly and expensive fires going back decades. The continued growth and development increase the public need for Local Hazard Mitigation Planning in Southern California.

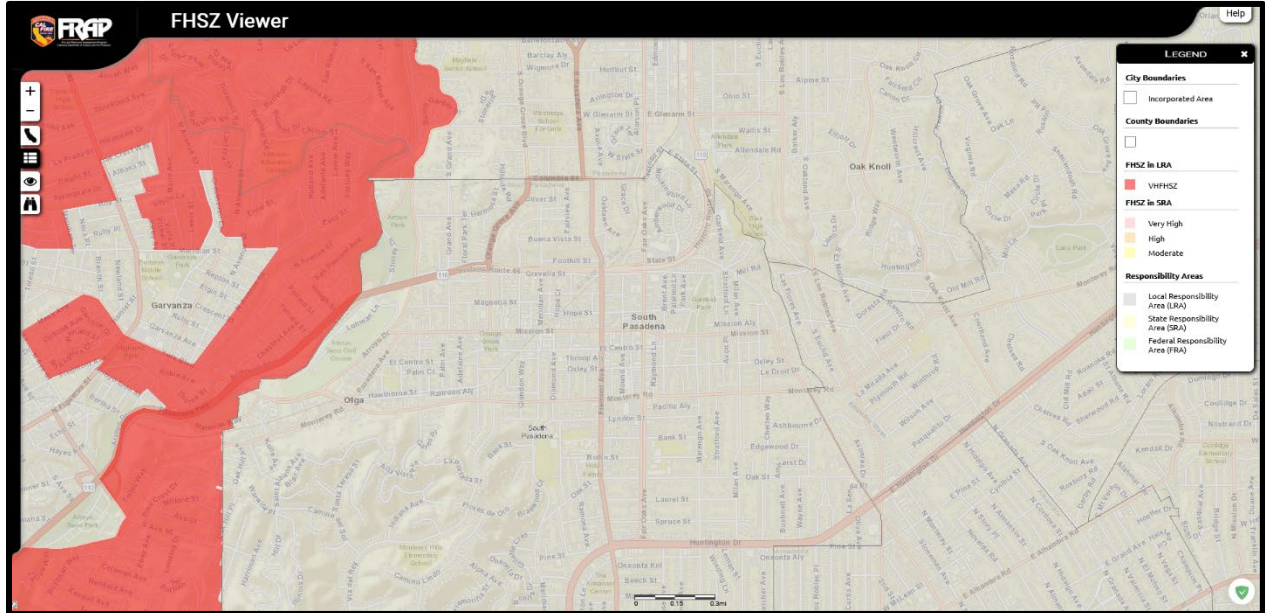
## **Vulnerability**

**Exhibit 17 - CalFire Fire Hazard Map - Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Area** indicates that the City of South Pasadena is not considered a very high fire risk by CalFire in its current map. However, the Monterey Hills area was considered a High Fire Hazard Severity Zone in previous CalFire map versions. The area is currently inspected, and clearance and cleanup are enforced utilizing the same brush clearance standards as in CalFire High Fire Hazard Severity Zones. Access to many areas of the hills is challenging due to narrow roadway widths and on-street parking. Efforts have been ongoing for the past few years to review on-street parking as it relates to safe evacuation of the public and appropriate access for fire apparatus.





Exhibit 17 - CalFire Fire Hazard Map  
Fire and Resource Assessment Program  
Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Area



Source: CalFire Office of the State Fire Marshal

### Climate Change Considerations

Recent concerns about the effects of climate change, particularly drought, are contributing to concerns about wildfire vulnerability. The term drought is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance. Unusually dry winters, or significantly less rainfall than average, can lead to relatively drier conditions and leave reservoirs and water tables lower. Anticipating that precipitation regimes may change in the future due to climate change, there may be more significant opportunities for wildfire hazards throughout the State of California. Increased future droughts and hotter temperatures could increase fuel loads within wildland areas increase the risk associated with wildland fires.



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## **4.5 Hazardous Materials and Human-Caused Events**

### **Identifying Hazardous Material Release Hazards**

“Hazardous materials” covers a large number of substances that are a danger to the public. These include toxic metals, chemicals, and gases; flammable and/or explosive liquids and solids; corrosive materials; infectious substances; and radioactive materials. The City of South Pasadena has adopted a Hazardous Materials Ordinance which requires that the city be notified of all use, storage, and transport of hazardous materials.

In addition to the immediate risk to life safety, public health, and air quality, the potential for water source contamination, and the potential environmental impacts of accidental hazardous materials releases and toxic substances, there is also concern over the long-term public health and environmental impacts that may result from the sustained use of or exposure to certain substances. An incident could result in the evacuation of a few people, a section of a facility, or an entire neighborhood.

### **Location**

The greatest probability of a major hazardous material incident is from a transportation accident. Even though South Pasadena has a major highway (State Route 110) that runs through the city, trucks over three tons are excluded. However, there are five major roadways used that are used as trucking routes (including local traffic) that are an alternate to SR 110. These include:

- Pasadena Avenue (West City limits to Mission Street)
- Mission Street (Pasadena Avenue to Fair Oaks Avenue)
- Fair Oaks Avenue (North City limits to Huntington Drive)
- Huntington Drive (South City limits to Garfield Avenue)
- Fremont Avenue (Huntington Drive to South City limits)

A large number of the trucks that transport goods throughout the city pass through the area described above. A significant number of them are transporting cargo along these transportation corridors that are considered hazardous materials. A HazMat incident along one of these streets would affect most areas within the city.

### **Extent**

Hazardous materials are everywhere and are accidentally released or spilled frequently during any day. In 2017, the California State Warning Center received approximately 11,000 hazardous material spill reports on hazardous material incidents and potentially hazardous material incidents. Most of these incidents are minor, but some cause significant impacts, such as injuries, evacuation, and the need for cleanup. Refer to **Table 21 - Hazardous Materials Releases in California (Partial January 2023)** for the incidents reported to CalOES statewide.



Table 21 - Hazardous Materials Releases in California (Partial January 2022)

Hazardous Materials Releases Reported to CalOES in 2022				
Type	Date / Time	County	City	Location
SPILL Report	10/12/2022 02:14 PM	SoCal Gas		
SPILL Report	10/18/2022 11:10 AM	Santa Barbara County	Santa Barbara	Waterways
SPILL Report	10/18/2022 10:59 AM	Alameda County	Alameda	Ship/Harbor/Port
SPILL Report	10/18/2022 10:21 AM	Kern County	Bakersfield	Railroad
SPILL Report	10/18/2022 10:04 AM	Humboldt County	Recology	Road
SPILL Report	10/18/2022 09:53 AM	Butte County	Durham	Merchant/Business
SPILL Report	10/18/2022 09:54 AM	Los Angeles County	Long Beach	Rail Road
SPILL Report	10/18/2022 09:21 AM	Kern County	Bakersfield	Merchant/Business
SPILL Report	10/18/2022 08:40 AM	Tulare County	Porterville	Residence
SPILL Report	10/18/2022 08:34 AM	Santa Barbara County	Santa Maria	Other - Petroleum
SPILL Report	10/18/2022 08:13 AM	Riverside County	Temecula	Merchant/Business

**Past Occurrences**

The City of South Pasadena has been fortunate to escape the impact of a major hazardous materials release. However, several minor incidents have been consistent with the characteristics of a community like South Pasadena.

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

**Probability of Future Events**

Although past occurrences can indicate future impacts, in the case of hazardous materials spills, the City is constantly improving the mechanisms by which they approve and regulate businesses that use hazardous materials. In addition, technological advances and increases in industry standards are also improving safety and further preventing/ minimizing potential releases of hazardous materials. As a result, future incidents will decrease as newer technologies, standards, and regulations are implemented.

**Vulnerability**

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





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The South Pasadena Fire Department (SPFD) is responsible for responding to hazardous materials incidents in the city. The SPFD is limited in its response capabilities to the level defined by the California State Fire Marshall First Responder – Operational training standard. This standard limits the SPFD response to the following actions:

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

Currently, the City of South Pasadena enjoys the benefits of a Unified Response mutual aid system administered by the Verdugo Fire Communications System. Verdugo would provide a qualified hazardous materials response unit in a hazardous materials incident. If a Verdugo unit is unavailable, the County of Los Angeles and the City of Los Angeles would be willing to provide hazardous materials units to the city.

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

### **Climate Change Considerations**

Anticipating that precipitation regimes may change in the future due to climate change, there may be a greater opportunity for the release of hazardous materials to enter local waterways and the groundwater aquifer. It is anticipated that if this concern increases, the City and other regulating agencies will re-visit procedures and practices to ensure that the greatest amount of protection occurs.



### 4.6 Windstorm

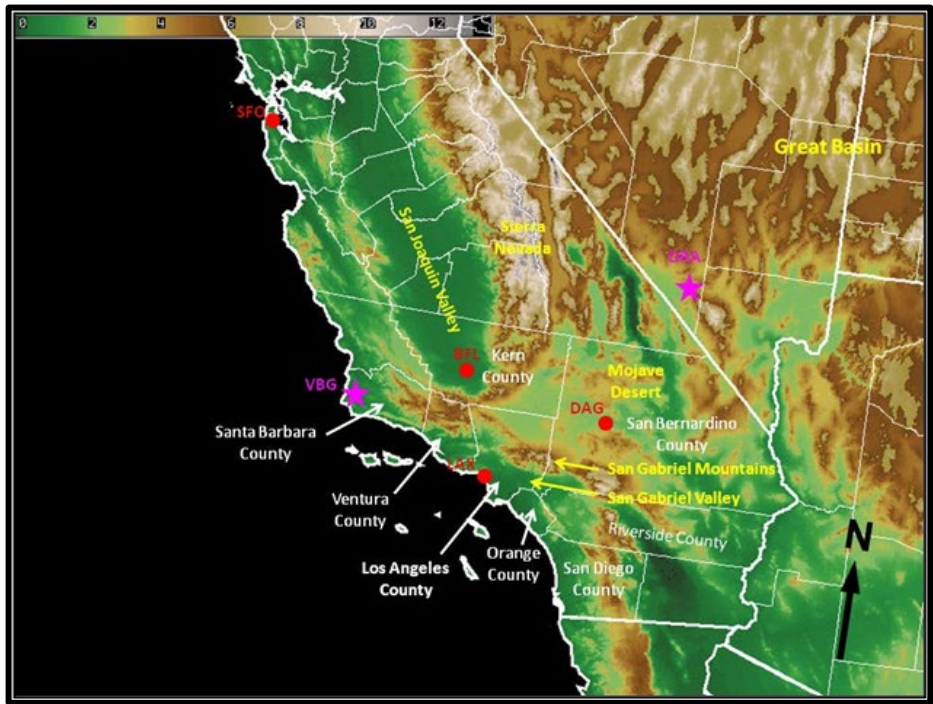
#### Identifying Windstorm Hazards

A windstorm is an event that is strong enough to cause at least light damage to trees and buildings and may or may not be accompanied by precipitation. Wind speeds during a windstorm typically exceed 34 miles per hour. Wind damage can be attributed to gusts (short bursts of high-speed winds) or more extended periods of stronger sustained winds. Although tornadoes and tropical cyclones produce wind damage, they are usually classified separately.

#### Location

The complex terrain of southern California, as illustrated in **Exhibit 18**, poses several forecast challenges for various types of wind events that impact the region. For example, there are well-documented “sundowner” winds along the Santa Ynez Range of Santa Barbara County. There are also the infamous and heavily researched Santa Ana winds that can fuel large wildfires throughout much of southern California. Another less well-known wind event type is the “Palmdale Wave,” which is associated with a strong north wind. The San Gabriel Mountains also play an important role in damaging northerly wind events that impact the San Gabriel Valley and eastern portions of the San Fernando Valley.

Exhibit 18 - Southern California Terrain Map



Source: NOAA/NWS Oxnard



Santa Ana winds, out of the Northeast or East-Northeast, usually result in little or no wind for the San Gabriel Valley and Los Angeles Coastal Plain. Instead, Santa Ana winds typically funnel through the lower mountain ranges in western Los Angeles County and continue down through the Santa Clarita Valley and the valleys of Ventura County. The western portions of the San Fernando Valley and the Santa Monica Mountains often experience gusty winds during Santa Ana events. Although damaging winds in the foothill and valley areas immediately south of the San Gabriel Mountains are very rare with Santa Ana events, it should be noted that mountain wave activity and downslope winds would be possible with a meteorological wind direction as northeasterly.

During strong Northwest wind events, damaging winds can occur through the Interstate 5 Corridor and down through the Santa Clarita Valley. Occasionally damaging winds reach the northern San Fernando Valley during Northwest wind events but rarely reach the San Gabriel Valley. So, it can be seen that unique conditions are required for damaging winds to occur in the San Gabriel Valley, as it is often sheltered from the more common Northwest and Northeast wind events.

**Extent**

Winds are horizontal flows of air that blow from areas of high pressure to low pressure. Wind strength depends on the difference between the high-and low-pressure systems and the distance between them. A steep pressure gradient results from a large pressure difference or a short distance between these systems and causes high winds. High winds are defined as those that last longer than one hour at greater than 35 miles per hour (mph) or for any length of time at greater than 57 mph. Winds measured at over 75 mph are considered in a Hurricane category.

**Past Occurrences**

Windstorms have occurred numerous times in Southern California. One of the most damaging occurred in December of 2011 when a powerful windstorm deprived approximately 80,000 homes and businesses of power for three days in San Gabriel Valley communities. Residents remained without power in Pasadena, Temple City, San Marino, and Arcadia. It knocked over numerous trees and broke power lines. At the wind event's peak, more than 400,000 electric power customers throughout Los Angeles County lost power, and around 235,000 in San Gabriel Valley. Refer to **Table 22** below.

**Table 22 - Damaging Wind Events from 1979 to 2014**

Damaging Wind Events (1979 – 2014)	
January 12, 1985	January 6, 1997
February 21, 1985	January 6, 2003
November 23, 1986	December 30, 2010
February 17, 1988	December 1, 2011
January 1, 1996	



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## **Probability of Future Events**

Damaging wind events in the San Gabriel Valley can be difficult to predict for several reasons. One reason is that damaging northerly wind events, such as the December 1, 2011 event, are very rare. Another reason is that Santa Ana events, associated with Northeast to East-Northeast winds for parts of Los Angeles County, typically produce very little wind in the San Gabriel Valley; however, the synoptic-scale conditions can be similar to northerly wind events such as the December 1, 2011 event. The complex terrain of Los Angeles County and the relatively coarse resolution of numerical models commonly used can make forecasting wind events in the San Gabriel Valley difficult, as models cannot fully resolve the winds in the boundary layer, let alone forecast small-scale details such as mountain waves and downslope wind storms.

## **Impacts**

Based on the region's history, windstorm events can be expected, perhaps annually, across broad areas of the region. The City of South Pasadena and the surrounding region can be adversely impacted during a windstorm. This can involve the City of South Pasadena's emergency response personnel during a wide-ranging windstorm or microburst tornadic activity.

Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift suction forces that pull building components and surface outward. Extreme wind forces the roof or entire building to fail, causing considerable damage. Debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a community, downed trees, power lines, and damaged property can be significant hindrances to emergency response and disaster recovery.

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

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

Windstorms can result in collapsed or damaged buildings or blocked roads and bridges and damaged traffic signals, streetlights, and parks, among others. Roads blocked by fallen trees during a windstorm may have severe consequences for people who need access to emergency services. When interrupted by blocked roads or power supplies, emergency response operations can be complicated. Industry and



commerce can suffer losses from electric service interruptions and extended road closures. They can also sustain direct losses to buildings, personnel, and other vital equipment. There are direct consequences to the local economy resulting from windstorms related to physical damages and interrupted services.

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

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

### **Vulnerability**

The entire City of South Pasadena and all critical facilities are susceptible to windstorm damage. A majority of windstorm damage that occurs is associated with fallen trees and tree limbs. Facilities located close to large trees may be more susceptible to windstorm damage. It is improbable that a windstorm would destroy any of the identified critical facilities. However, the replacement values for these facilities may be referenced in **Table 6: South Pasadena Critical Facilities List**.

### **Climate Change Considerations**

It is anticipated that wind patterns and windstorm development may be altered due to climate change. The resulting change could increase future storm intensity and duration and potentially change the location of where these storms are generated. With this in mind, it will be necessary for the City to consider how anticipated changes in weather patterns may change future events and how they respond and mitigate hazards associated with windstorms.



## **4.7 Drought and Water Resources**

### **Drought**

#### **Identifying Drought Hazards**

A drought is a period of dry weather that persists long enough to cause problems such as crop damage or water supply shortages. Droughts can occur in short durations (single-year occurrence) or persist for several years (multi-year), impacting hydrologic cycles and biological communities. Droughts may not be predictable, but they should be expected. They occur with some regularity and varying levels of severity. The magnitude and duration of drought can be predicted based on historical records and should be considered in water resource planning.

#### **Water Resources**

Groundwater is an essential component of our nation’s freshwater resources. Groundwater use is of fundamental importance to human life and is also significant to economic vitality. Inventories of groundwater and surface water use patterns in the United States emphasize the importance of groundwater. The United States Geological Survey (USGS) compiles national water use information every five years and publishes a report that summarizes this information. Groundwater is a hidden resource. At one time, its purity and availability were taken for granted. Now contamination and availability are serious issues. The following should be considered:

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

#### **Location**

Droughts can occur over large regions (multiple states) or be isolated to small areas such as a city or county. The Los Angeles County Hazard Mitigation Plan notes the entire county is susceptible to and at risk of drought conditions. Likewise, the City of South Pasadena is susceptible to drought.

The City has four wells located within the Main Basin: Graves Well No. 2, Wilson Well No. 2, Wilson Well No. 3, and Wilson Well No. 4, with approximate pumping capacities of 705 GPM, 750 GPM, 1,960 GPM, and 1,100 GPM, respectively, although Wilson Well No. 2 is inactive. The collective capacity is about 5,000 GPM.

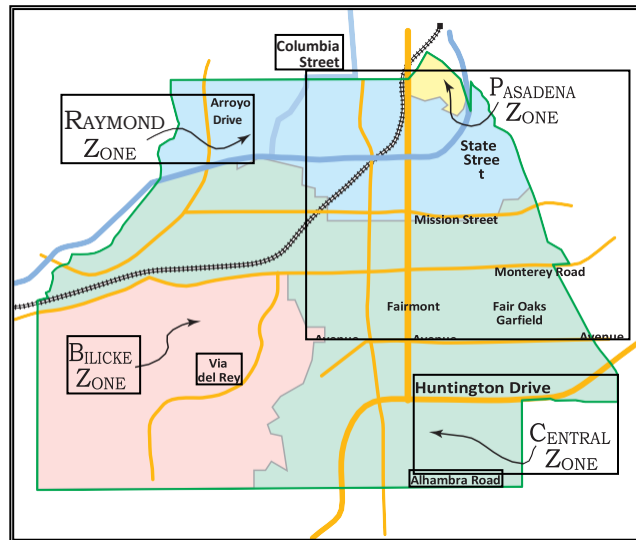
Groundwater from Graves Well No. 2 is pumped into the Graves reservoir, and groundwater from the Wilson Wells is pumped into the Wilson reservoir. The Graves reservoir has a capacity of 1.0 million gallons



(MG) and the Wilson reservoir has a capacity of 1.3 MG. A booster station at each well site pumps water through a transmission main that leads to the Garfield reservoir, updated in 2017, with a total capacity of 6.5 MG located within the City’s service area. The Garfield reservoir provides water to two distribution reservoirs, the Grand and Westside Reservoirs, and two elevated steel tanks, the Raymond Hill Tank and Bilicke Tank, within the City’s service area.

The City’s distribution system contains four pressure zones: the Raymond Zone, the Central Zone, the Bilicke Zone, and the Pasadena Zone. The Raymond Zone, the Central Zone, and the Bilicke Zone receive water from the City’s system. In contrast, the Pasadena Zone, located at the top of Raymond Hill, receives water from the City of Pasadena. The City can also deliver water to Raymond Hill Tank when the City of Pasadena cannot supply water to the Pasadena Zone.

Exhibit 19 - Map of Water Pressure Zones



Source: City of South Pasadena

**Extent**

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



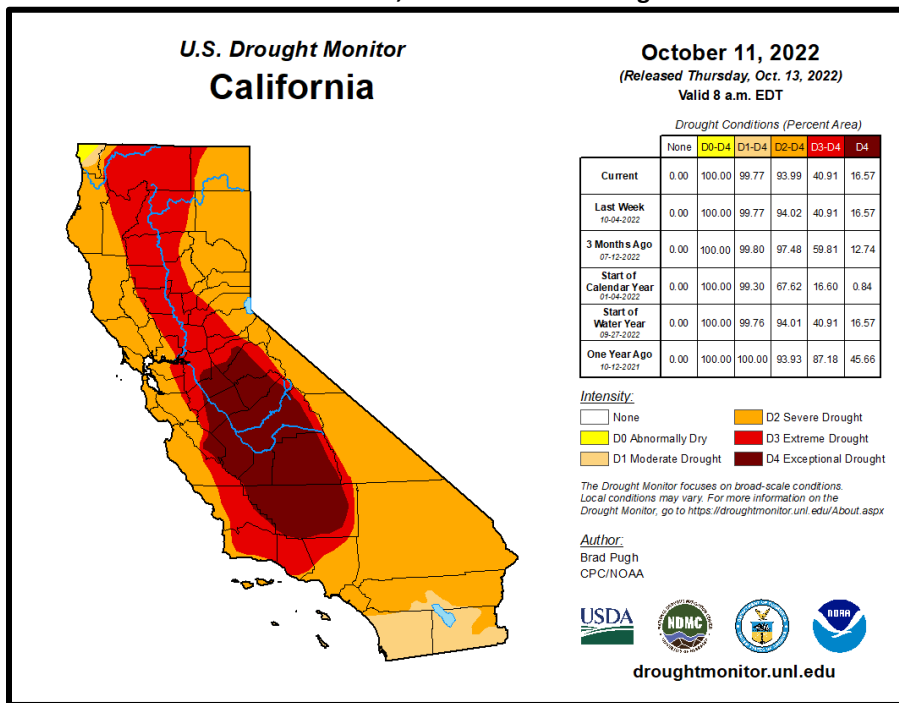


central Sierra Nevada. These investigations indicate that California has been subject to droughts more severe and more prolonged than those witnessed in the brief historical record.

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

The following exhibits show how droughts are monitored throughout the Country. The first one (Exhibit 20) shows the level of drought in October 2022, while the second one (Exhibit 21) shows the level of drought in July of 2023. These tools are helpful to agencies in planning for drought emergencies.

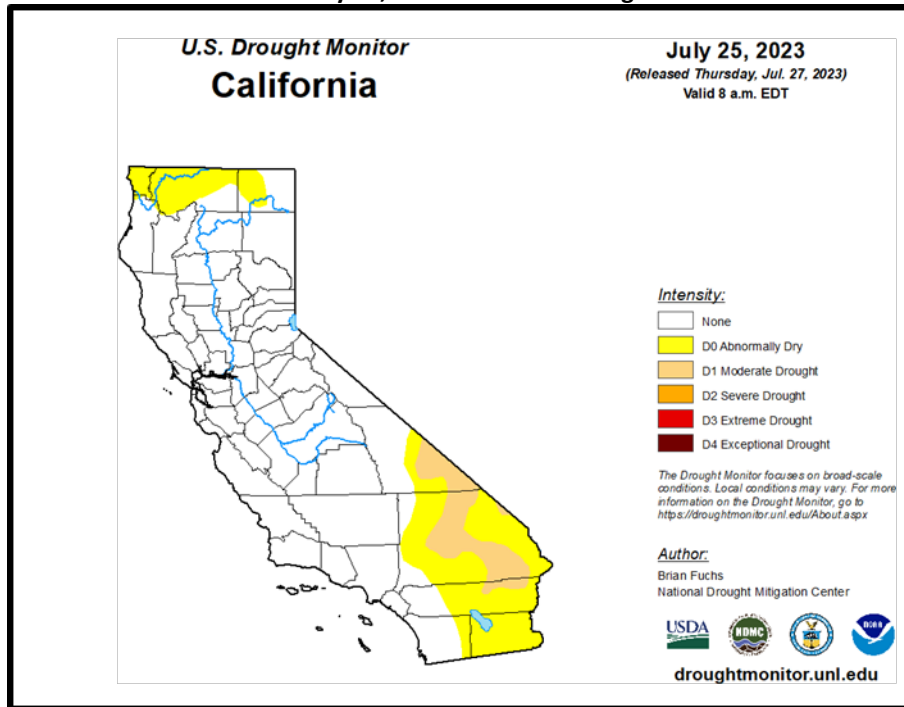
Exhibit 20 - October 11, 2022 California Drought Monitor



Source - Droughtmonitor.unl.edu



Exhibit 21 – July 25, 2023 California Drought Monitor



Source - Droughtmonitor.unl.edu

An increased quantity of groundwater is being withdrawn to meet the demands of a growing population. Some typical threats associated with this include overdraft, drawdown, and subsidence. An overdraft occurs when groundwater is removed faster than recharge can replace it. This can result in the following:

- Permanent loss of a portion of its storage capacity.
- Change that can cause water of unusable quality to contaminate good water in coastal basins where saltwater intrusion can occur.

Generally, any withdrawal over safe yield (the amount that can be withdrawn without producing an undesirable result) is an overdraft. Drawdown differs significantly from overdraft. It results in a temporarily lowered water table generally caused by pumping. In this situation, the water table recovers when the supply is replenished.

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

**Past Occurrences**

In recent history, Los Angeles County was impacted by four statewide drought occurrences: 1976-77, 1987- 1992, 2007-2009, 2011-2017, and 2019-2022. **Table 23 - Historical Drought Events** presents the impacts of drought in the City of South Pasadena.



**Table 23 - Historical Drought Events**

<b>Date</b>	<b>Impact/Property Damage</b>
1863-1864	Statewide - Unknown
1877	Statewide - Unknown
1928-1937	Reported as one of the most prolonged and severe in state history.
1947-1949	Statewide
1976-1977	Water conservation ordered
1987-1992	Severe drought, water conservation ordered
2007-2009	Water waste regulations are strictly enforced; local water providers request voluntary 15% conservation savings.
2011-2018	The period between late 2011 and 2018 was the driest in California history since record-keeping began
2020-2023	The drought conditions from the past decade have continued into the current decade.

**Probability of Future Events**

One approach to evaluating the probability of future events focuses on the magnitude of the worst-case drought because the degree of shortfall determines what actions the community would take and the resulting hardships the public would face. It should also consider the chance of that event occurring before a solution is achieved. The amount of time that elapses before new supply can be developed is an essential consideration because it also has a bearing on the degree of risk faced by water customers; the longer the delay, the greater the risk.

The City is exploring multiple avenues to conserve water throughout the city for residential and commercial facilities. Goal II of the South Pasadena Green Action Plan is to Enhance Water Conservation Projects and Programs and includes a series of strategies and actions to promote water conservation efforts throughout the City. Strategies include providing education and promoting greywater systems, using water conservation devices, providing educational materials and expert advice on water conservation practices, and increasing conservation efforts outdoors.

**Impacts**

The City of South Pasadena was impacted by the ongoing drought that affected the State over the past few years. The City had declared a Stage 2 Serious Water Supply Shortage and placed limits on watering days in order to ensure enough water to sustain the city moving forward. Watering or irrigation of lawn, landscape, or other vegetated areas, was limited to two designated days per week. In addition, leaks were to be repaired within 48 hours of notification. Other permanent water restrictions also applied. The City’s Water Conservation Ordinance mandates year-round water use efficiency best practices. Residents and businesses must practice measures such as not watering their landscape between 9:00 a.m. and 5:00 p.m. Large. New landscapes must follow water-efficient guidelines detailed in the City’s Water Efficient



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Landscape Ordinance. The following watering restrictions are effective at all times regardless of what water supply stage the City is experiencing:

- Watering between the hours of 9:00 a.m. and 5:00 p.m. is prohibited
- Excessive water run-off from sprinklers/irrigation is prohibited
- Watering during periods of rain and 48 hours after is prohibited
- Washing down hard or paved surfaces is prohibited
- Vehicles must be washed with a hose equipped with a shutoff nozzle
- Watering is limited to 15 minutes per station per day
- Using water to clean, fill or maintain levels in decorative fountains, ponds, or other similar aesthetic structures is prohibited unless the structure uses a recirculating water system.

### **Vulnerability**

The responsibility for groundwater protection collectively belongs to federal, state, and local government agencies. Federal and state governments regulate groundwater through laws, regulations, and policies. In many cases, state and local laws are stricter versions of federal legislation, which serves as a valuable baseline for building state and local laws. The City's UWMP pinpoints action items with directions on specific activities that the city, organizations, and or residents of South Pasadena can undertake or implement to reduce the risk and prevent the loss of services in the event of a significant water issue.

The City of South Pasadena drought mitigation action items provide direction and specific activities that the City, organizations, and residents in the City of South Pasadena can undertake to reduce the risk and prevent the impact of a drought or other supply issues or conditions that may have an impact on the residents and or water operations within the City of South Pasadena. The UWMP Act (Water Code Sections 10610 through 10656) requires that every urban water supplier provides and adopts an Urban Water Management Plan (UWMP). The City updated and published its Urban Water Management Plan in 2020, published in September 2021. Since then, the City's Water Division has updated some items in the plan, and they are currently being discussed for future implementation or adoption through City Council approval. The UWMP is kept on file in the offices of the South Pasadena Water Department.

### **Climate Change Considerations**

According to the City's UWMP, consistent future use of groundwater sources may be affected by climate change. Climate change forecasts indicate a potentially significant decrease in the recharge of groundwater basins. Due to climate change, the City of South Pasadena may expect more severe droughts.



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## **4.8 Reservoir Failure**

### **Identifying Reservoir Failure Hazards**

There are 103 dams in Los Angeles County, owned by 23 agencies or organizations, ranging from the Federal government to Home Owner Associations. These dams hold billions of gallons of water in reservoirs. Releases of water from the major reservoirs are designed to protect Southern California from floodwaters and to store domestic water. Seismic activity can compromise the dam structures, and the resultant flooding could cause catastrophic flooding. Following the 1971 Sylmar earthquake, the Lower Van Norman Dam showed signs of structural compromise, and tens of thousands of persons had to be evacuated until the dam could be drained. The dam has never been refilled.

California Government Code § 8589.5 (1972) requires dam owners to submit to the Office of Emergency Services maps showing inundation zones for catastrophic dam failure. The Office of Emergency Services is responsible for designating areas with a potential loss of life and reviewing procedures for population control and evacuation below dams in the event of a dam failure.

### **Location**

Devil's Gate Dam and Reservoir is a stormwater and flood management facility located in the City of Pasadena, approximately 14 miles north of downtown Los Angeles. It is immediately north of Interstate Highway 210, near the Rose Bowl Stadium, and south of the San Gabriel Mountains. It is located where the Arroyo Seco stream emerges from the mountains into the alluvial plain. The dam separates the upper and lower watersheds of the Arroyo Seco Channel. It provides significant storage capacity for stormwater runoff originating from approximately 20,416 acres (31.9 square miles) of primarily undeveloped land north in the San Gabriel Mountains. The Raymond Basin underlies the dam and reservoir area.

Devil's Gate Reservoir area covers approximately 175 acres (0.27 square miles) and has a design storage capacity of 4,600 acre-feet (AF). Devil's Gate Dam is a Concrete Gravity Arch Structure. It is 100 feet high, 310 feet long, 30 feet wide at its crest, and 99 feet wide at its buttress. The dam is under the jurisdiction of the California Department of Water Resources Division of Safety of Dams (DSOD).

Completed in 1920, the Devil's Gate Dam and Reservoir facility was the first flood control facility built by the Los Angeles County Flood Control District to provide flood protection to the Cities of Pasadena, South Pasadena, and Los Angeles. It continues to serve this function today by capturing sediment washed into the reservoir by storm flows, attenuating storm flows, and subsequently controlling water releases to the downstream Arroyo Seco Channel. The Dam protects an inundation area of 1,783 acres, including 3,590 parcels, and 10.3 million square feet of structures. Downstream of Devil's Gate Dam, the lower half of the Arroyo Seco watershed is distinctly different from the upper watershed. The stream is channelized chiefly downstream, and the watershed is highly urbanized.



## Extent

Reservoir or dam failure generally occurs for one of three reasons: ground shaking from an earthquake in excess of design assumptions, structural instability, or heavy rains over design capacity. In addition, reservoirs and dams located in seismically active regions may overtop due to seiche during seismic activity or seismically-induced landsliding. The resulting disaster could affect downstream communities and neighborhoods in the inundation area.

**Figure 7 - Devil's Gate Dam and Reservoir**



Source: Los Angeles County Flood Control District

## Previous Occurrences

In 2009, the Station Fire burned over 160,000 acres in the San Gabriel Mountains. This was the largest fire in Angeles National Forest's recorded history. Approximately 68 percent of the watershed tributary to Devil's Gate Reservoir (approximately 100 percent of the undeveloped portion) was burned, making sediment deposition inevitable during subsequent storm events. Following this unprecedented burn of the watershed, the storms that occurred in the two wet seasons after the fire deposited more than one million cubic yards combined.

Over the last three years, Los Angeles County Public Works removed 1.3 million cubic yards of sediment from Devil's Gate Reservoir. This allowed the Devil's Gate Dam to regulate high runoff flows during the 2021-22 storm season to mitigate flood risk to communities downstream.

Public Works conducted its annual reservoir maintenance from September 1, 2022, to December 15, 2022, to prepare the facility for the yearly storm season. The work included clearing vegetation within the reservoir basin and excavating excess sediment that washed in during the past storm season. Additional time is factored in for the erosion repairs along the side slopes and the re-building of a low-flow diversion and two low-flow channels along the side slopes that serve the two maintenance areas at the bottom of the reservoir.



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### **Probability of Future Events**

The Devil's Gate Dam routinely undergoes inspection and maintenance by the County of Los Angeles. Any deficiencies in the dam construction would be noticed, and measures would be taken for repairs. In the event of a severe storm, the County would have the ability to let out water into the Arroyo in a controlled manner to relieve pressure on the dam and prevent overtopping.

### **Impacts**

A catastrophic dam failure would create a severe flooding situation along the Arroyo and impact the area within the flood zone. The City's Golf Course, Racquet Ball facility and the San Pasqual Stables would face significant damage.

### **Vulnerability**

The possibility of future reservoir failure or leaks cannot be discounted based on the region's susceptibility to earthquake damage. Ongoing responsibility for maintaining and inspecting the reservoirs belongs with the Los Angeles County Flood Control District to prevent future occurrences.





## **4.9 Summary of Vulnerability**

### **4.9.1 SIGNIFICANT, MODERATE, AND LIMITED HAZARDS**

Vulnerability assessments within each hazard profile are used to understand the varying levels of risk to the City of South Pasadena. Based on these assessments, LHMP planning personnel concluded that some facilities involve Significant Risk, some involve Moderate Risk, and some are Limited Risk.

### **4.9.2 PLANNING ANALYSIS BY FACILITY**

Using the CPRI Risk Assessment for the City of South Pasadena (refer to **Tables 9 and 10**) to determine the overall risks posed to the City by the hazards listed in **Table 8** and the detailed assessment made for the City using the **Hazard Planning Analysis Worksheet (Table 12)**, an analysis was made for each facility using the **Table 11 Worksheet**.

**Table 22 - Planning Consideration Assessments by Facility** shows a summary of critical facilities intersecting with South Pasadena's hazard areas. Those facilities that intersect with a hazard area are indicated with an “**S**” for Severe, an “**M**” for Moderate Risk, and an “**L**” for Limited Risk. A blank box notes that the hazard does not apply to that facility.



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**Table 24 - Planning Consideration Assessments by Facility**

	Facility	Earthquake	Severe Storms and Localized Flooding	Landslides and Mudflow	Wildland and Urban Fire	Hazmat and Human Caused	Windstorms	Drought	Reservoir Failure
1	City Hall	L	L			M	L	L	
2	Council Chambers	L	L			M	L	L	
3	Police Department	L	L			M	L	L	
4	Fire Department	L	L			M	L	L	
5	Library & Community Room	S	S			L	L	L	
6	Senior Center	M	L			L	L	L	
7	Eddie Park House	S	L			L	L	L	
8	War Memorial	S	S			M	L	L	
9	Orange Grove Recreation Building	S	L			M	L	L	

**Hazard Planning Considerations: S - Significant Risk M - Moderate Risk L - Limited Risk**



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**Table 24 - Planning Consideration Assessments by Facility (Continued)**

Facility		Earthquake	Severe Storms and Localized Flooding	Landslides and Mudflow	Wildland and Urban Fire	Hazmat and Human Caused	Windstorms	Drought	Reservoir Failure
10	Meridian Iron Works Museum	S	L			L	L	L	
11	Garfield Park Youth House	L	L			L	L	L	
12	Public Works Yard	M	L			L	L	L	
13	Garfield Reservoir	L	L			L	L	L	
14	Grand Reservoir	L	L	L	L	L	L	L	
15	Westside Reservoir	L	L	L	L		L	L	
16	Kolle Interconnection	S	L	L	L	L	L	L	
17	Indiana Pump Station	S	L	L	L	L	L	L	
18	Bilicke Tank	S	L	L	L		L	L	

**Hazard Planning Considerations: S - Significant Risk M - Moderate Risk L - Limited Risk**



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**Table 24 - Planning Consideration Assessments by Facility (Continued)**

Facility		Earthquake	Severe Storms and Localized Flooding	Landslides and Mudflow	Wildland and Urban Fire	Hazmat and Human Caused	Windstorms	Drought	Reservoir Failure
19	Raymond Tank	<b>S</b>	<b>L</b>			<b>L</b>	<b>L</b>	<b>L</b>	
20	Wilson Reservoir	<b>L</b>	<b>L</b>			<b>L</b>	<b>L</b>	<b>L</b>	
21	Wilson Well #2	<b>L</b>	<b>L</b>			<b>L</b>	<b>L</b>	<b>L</b>	
22	Graves Reservoir	<b>L</b>	<b>L</b>			<b>L</b>	<b>L</b>	<b>L</b>	
23	San Pasqual Stables	<b>S</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>
24	Arroyo Seco Golf Course	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>
25	Arroyo Seco Racquet Club	<b>S</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>

**Hazard Planning Considerations: S - Significant Risk M - Moderate Risk L - Limited Risk**



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**4.9.3 FACILITIES MOST AT RISK**

**Table 25 - Facilities Most at Risk**

Facility	Earthquake	Severe Storms and Localized Flooding	Landslides and Mudflow	Wildland and Urban Fire	Hazmat and Human Caused	Windstorms	Drought	Reservoir Failure
War Memorial	<b>S</b>	<b>S</b>			<b>M</b>	<b>L</b>	<b>L</b>	
Library	<b>S</b>	<b>S</b>			<b>L</b>	<b>L</b>	<b>L</b>	
San Pasqual Stables	<b>S</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>
Arroyo Seco Racquet Club	<b>S</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>
Arroyo Seco Golf Course	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>
Orange Grove Recreation	<b>S</b>	<b>L</b>			<b>M</b>	<b>L</b>	<b>L</b>	
Bilicke Tank	<b>S</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	
Kolle Interconnection	<b>S</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	
Indiana Pump Station	<b>S</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	

**Hazard Planning Considerations: S - Significant Risk M - Moderate Risk L - Limited Risk**



4.9.4 POTENTIAL LOSSES

Table 26 - Costliest Critical Facilities identifies the critical facilities in the city with the highest replacement value (combination of building replacement and contents value). Should these facilities be destroyed by a hazard event, their replacement will be more costly than other identified critical facilities.

Table 26 - Costliest Critical Facilities

Facility	Replacement Value
Library and Community Room	\$168,916,846
Police and Fire Department	\$60,000,000
San Pasqual Stables	\$49,842,804
City Hall and Council Chambers	\$40,000,000
War Memorial	\$38,468,046

4.10 History of Federally Declared Disasters

In order to put perspective into the hazards associated with each of the City’s facilities and the potential for economic losses, the following table indicates federally declared disasters in the State of California since 1980.

Table 27 - List of Federally Declared Disasters in California from 1980 to 2022

ID #	Date	Description
4619	8/14/2021	Caldor Fire
4610	7/14/2021	California Wildfires
4569	10/16/2020	California Wildfires
4558	8/22/2020	Northern California Lightning Fires
5280	11/8/2018	Hill and Woolsey Fires
4407	11/8/2018	Camp Fire
5259	8/2/2018	Carr Fire
4353	1/2/2018	Santa Barbara and Ventura County Mudslides
5228	12/7/2017	Lilac Fire
5225	12/5/2017	Creek and Rye Fires
4396	12/8/2017	Thomas Wildfire
4344	10/9/2017	Sonoma and Napa Wildfires
4305	03/16/2017	Severe Winter Storms, Flooding, and Mudslides
4301	02/14/2017	Severe Winter Storms, Flooding, and Mudslides



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**Table 27 - List of Federally Declared Disasters in California from 1980 to 2021 (Continued)**

ID #	Date	Description
4193	09/11/2014	Earthquake
4158	12/13/2013	Rim Fire
1968	04/18/2011	Tsunami Waves
1952	01/26/2011	Winter Storms, Flooding, and Debris and Mud Flows
1911	05/07/2010	Earthquake
1884	03/08/2010	Severe Winter Storms, Flooding, Debris & Mud Flows
1810	11/18/2008	Wildfires
1731	10/24/2007	Wildfires
1689	03/13/2007	Severe Freeze
1646	06/05/2006	Severe Storms, Flooding, Landslides, and Mudslides
1628	02/03/2006	Severe Storms, Flooding, Mudslides, and Landslides
1585	04/14/2005	Severe Storms, Flooding, Landslides, Mud & Debris Flows
1577	02/04/2005	Severe Storms, Flooding, Debris Flows, and Mudslides
1529	06/30/2004	Flooding As A Result Of a Levee Break
1505	01/13/2004	Earthquake
1498	10/27/2003	Wildfires
1342	09/14/2000	Earthquake
1267	02/09/1999	Severe Freeze
1203	02/09/1998	Severe Winter Storms and Flooding
1155	01/04/1997	Severe Storms/Flooding
1046	03/12/1995	Severe Winter Storms, Flooding, Landslides, Mud Flows
1044	01/10/1995	Severe Winter Storms, Flooding, Landslides, Mud Flows
1038	09/13/1994	El Nino Effect (The Salmon Industry)
1008	01/17/1994	Northridge Earthquake
1005	10/28/1993	Fires, Mud & Landslides, Soil Erosion, Flooding
979	02/03/1993	Severe Storm, Winter Storm, Mud & Landslides, Flooding
958	08/29/1992	Old Gulch, Fountain Fires
947	07/02/1992	Earthquake, Aftershocks
943	05/04/1992	Earthquake, Aftershocks





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**Table 27 - List of Federally Declared Disasters in California from 1980 to 2021 (Continued)**

ID #	Date	Description
942	05/02/1992	Fire during a Period of Civil Unrest
935	02/25/1992	Snow Storms, Heavy Rain, High Winds, Flooding, Mudslides
919	10/22/1991	Oakland Hills Fire
894	02/11/1991	Severe Freeze
872	06/30/1990	Fires
845	10/18/1989	Loma Prieta Earthquake
815	09/29/1988	Wildfires
812	02/05/1988	Severe Storms, High Tides, Flooding
799	10/07/1987	Earthquake, Aftershocks
758	02/21/1986	Severe Storms, Flooding
739	07/18/1985	Grass, Wildlands, Forest Fires
690	09/22/1983	Flash Flooding
687	07/01/1983	Flooding
682	05/05/1983	Coalinga Earthquake
677	02/09/1983	Coastal Storms, Flooding, Slides, Tornadoes
669	09/24/1982	Levee Break
657	04/24/1982	Urban Fire
651	01/07/1982	Severe Storms, Flooding, Mudslides, High Tide
635	11/27/1980	Brush, Timber Fires
633	10/02/1980	Levee Break and Flooding
615	02/21/1980	Severe Storms, Flooding, Mudslides, Flooding



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## **Section Five - Hazard Mitigation Actions**

### **5.1 Hazard Mitigation Overview**

#### **5.1.1 HAZARD MITIGATION GOALS**

The plan goals, presented in the **Mitigation Priorities and Goals** section of **Chapter 1**, serve as a basis for promoting sound public policy designed to protect critical facilities, infrastructure, and the environment from hazards. In addition, the Plan goals guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. The goals also serve as checkpoints as agencies and organizations implement mitigation action items. Refer to **Section 1.6**.

The hazard mitigation actions identified below list activities the City will utilize to reduce its risk of potential hazards. These mitigation actions were identified through the planning process with the Technical Advisory Committee and public input. The TAC determined that since the last LHMP was approved in 2019, there have been no changes in within the city that would affect hazard mitigation priorities. Some of these actions may be eligible for funding through Federal and State grant programs and other funding sources made available to the City. The mitigation actions are intended to address the comprehensive range of identified hazards. Some actions may address risk reduction from multiple hazards.

#### **5.1.2 HAZARD MITIGATION PRIORITIZATION**

The TAC used the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria through discussion and analysis, as described in **Table 28 - STAPLE/E Review and Selection Criteria**. This methodology (as endorsed by FEMA) requires that social, technical, administrative, political, legal, economic, and environmental considerations be considered when reviewing potential actions to undertake. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on the City's capabilities.



**Table 28 - STAPLE-E Review and Section Criteria**

<b>Social</b>
<ul style="list-style-type: none"> <li>Is the proposed action socially acceptable to the jurisdiction and surrounding community?</li> <li>Are there equity issues involved that would mean that one segment of the jurisdiction and/or community is treated unfairly?</li> <li>Will the action cause social disruption?</li> </ul>
<b>Technical</b>
<ul style="list-style-type: none"> <li>Will the proposed action work?</li> <li>Will it create more problems than it solves?</li> <li>Does it solve a problem or only a symptom?</li> <li>Is it the most useful action in light of other jurisdiction goals?</li> </ul>
<b>Administrative</b>
<ul style="list-style-type: none"> <li>Can the jurisdiction implement the action?</li> <li>Is there someone to coordinate and lead the effort?</li> <li>Is there sufficient funding, staff, and technical support available?</li> <li>Are there ongoing administrative requirements that need to be met?</li> </ul>
<b>Political</b>
<ul style="list-style-type: none"> <li>Is the action politically acceptable?</li> <li>Is there public support both to implement and maintain the project?</li> </ul>
<b>Legal</b>
<ul style="list-style-type: none"> <li>Is the jurisdiction authorized to implement the proposed action?</li> <li>Are there legal side effects? Could the activity be construed as a taking?</li> <li>Will the jurisdiction be liable for action or lack of action?</li> <li>Will the activity be challenged?</li> </ul>
<b>Economic</b>
<ul style="list-style-type: none"> <li>What are the costs and benefits of this action?</li> <li>Do the benefits exceed the costs?</li> <li>Are initial, maintenance, and administrative costs taken into account?</li> <li>Has funding been secured for the proposed action? What are the potential funding sources (public, non-profit, and private) if not?</li> <li>How will this action affect the fiscal capability of the jurisdiction?</li> <li>What burden will this action place on the tax base or local economy?</li> <li>What are the budget and revenue effects of this activity?</li> <li>Does the action contribute to other jurisdiction goals?</li> <li>What benefits will the action provide?</li> </ul>
<b>Environmental</b>
<ul style="list-style-type: none"> <li>How will the action affect the environment?</li> <li>Will the action need environmental regulatory approvals?</li> <li>Will it meet local and state regulatory requirements?</li> <li>Are endangered or threatened species likely to be affected?</li> </ul>



### **5.1.3 HAZARD MITIGATION BENEFIT-COST REVIEW**

A cost-benefit review was applied to prioritize the mitigation recommendations for implementation. The priority for implementing mitigation recommendations depends upon the recommendation's overall feasibility when considering monetary and non-monetary costs and benefits associated with each action. The cost-benefit table for each hazard analyzes the benefit, cost, and relative priority rank (High, Medium, and Low) for each mitigation activity. The general guidelines are listed below.

- High - Benefits are perceived to exceed costs without further study or evaluation.
- Medium - Benefits are perceived to exceed costs but may require further study or evaluation before implementation.
- Low - Benefits and the associated costs require an additional evaluation prior to implementation.

Projects identified in this LHMP receiving funding, either from City resources or grant opportunities, shall be cost-effective and assist in efforts to help the City to mitigate or recover from disasters. Some of the projects identified are already funded through existing mechanisms, while others await evaluating and identifying potential funding sources. Most of the projects are ongoing to ensure mitigation measures are implemented within the City. It is not anticipated that all future projects will be identified in this LHMP. The LHMP will help guide the City to prioritize, be flexible, and identify critical mitigation strategy needs that may arise from a disaster when there is no time to update the local plan.

It is also essential for the City to protect critical facilities and infrastructure. South Pasadena has a Capital Improvement Program in place (**Table 34**) and is actively working to protect facilities and infrastructure critical to the city.

#### **Mitigation Funding Strategy**

South Pasadena intends to fund mitigation activities deemed feasible to accomplish with a combination of City budget funds and Federal and/or state grant funds when available. These funds could be from a variety of sources, including FEMA Pre-Disaster Mitigation Grant Funding (PDM), FEMA Hazard Mitigation Grant Program (HMGP) funding, and Emergency Management Performance Grant (EMPG) program funds. Refer to **Table 36**.

These grants will be investigated, and the City will apply for funding once a project has been identified as viable or, during the investigative phase, if funding is available to assist with those associated costs. In addition, the TAC will facilitate and monitor grant funding opportunities as they arise and report on grant application outcomes as part of the annual reporting required under the LHMP.

### **5.2 Review of Previous Mitigation Actions from the 2019 LHMP**

Refer to **Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status**.



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### **5.3 Current Hazard Mitigation Actions**

The process used by the Technical Advisory Committee to identify hazard mitigation actions for this Plan included reviewing the City’s hazard assessment presented in Section Four and discussing concerns and issues to reduce hazards to critical facilities and infrastructure.

Multi-hazard action items are those activities that pertain to two or more of the nine hazards in the mitigation plan: Drought, Earthquake, Hazardous Materials, Landslide and Mudflow, Severe Storms and Localized Flooding, Water Resource, Wildland Fire, and Windstorm.

Refer to **Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions**.



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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>1. Earthquake Hazard Related Actions</b>		
<p><b>A.</b> Require a full site-specific geologic study of any hillside site within the purview of the hillside ordinance. The study shall adequately address site-specific questions such as slope stability, erosion, subsidence, groundwater effects and earthquakes.</p>	<p align="center">Planning and Building Department</p>	<p align="center">These studies continue to be required for all hillside development within the city.</p>
<p><b>B.</b> Continue to review the Regional Earthquake Transportation Evacuation Routes and make any required updates to the appropriate documents, such as the City's Emergency Operations Plan.</p>	<p align="center">Police Department, Fire Department</p>	<p align="center">These continue to be reviewed by the City's Police and Fire Departments</p>
<p><b>C.</b> Continue to support the City's Community Emergency Response Team (CERT) of volunteers that have completed the recognized training course to ensure that in the event of a major disaster neighbors will be trained to help with immediate life-saving and life sustaining needs.</p>	<p align="center">Police Department, Fire Department</p>	<p align="center">The CERT volunteers continue to assist in preparation of disaster events and are an integral part of the City's emergency response program.</p>
<p><b>D.</b> Identification of funding sources for retrofitting seismically vulnerable structures, identification of at-risk structures and infrastructure in the city, and reductions of hazards in structures through educational awareness programs.</p>	<p align="center">Planning and Building Department, Public Works Department</p>	<p align="center">This continues to be an on-going effort for the Planning and Building Department and the Public Works Department.</p>
<p><b>E.</b> During storm periods, monitor catch basins to ensure that they are kept clear of debris to maintain optimal conditions in the event of heavy rainfall.</p>	<p align="center">Public Works Department</p>	<p align="center">This continues to be an on-going effort by the Public Works Department.</p>



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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status (Continued)**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>2. Flooding Hazard Related Actions</b>		
<p><b>A.</b> Review and update the City’s existing ordinances as they relate to storm / flooding hazards, consistent with the risks identified in this LHMP.</p>	<p align="center">Planning and Building Department</p>	<p align="center">This continues to be an on-going effort for the Planning and Building Department.</p>
<p><b>B.</b> Monitor and review California State Water Resources Control Board regulations and permit requirements to ensure consistency with City policies and regulations. This includes on-site retention of storm water runoff from impervious surfaces and the implementation of Low Impact Development (LIDs) standards on new development.</p>	<p align="center">Planning and Building Department, Public Works Department</p>	<p align="center">This continues to be an on-going effort for the Planning and Building Department and the Public Works Department.</p>
<p><b>C.</b> In coordination with the Los Angeles County Flood Control District, evaluate the effectiveness of current policies and ordinances to ensure that storm water runoff from impervious surfaces does not contribute to flooding.</p>	<p align="center">Planning and Building Department, Public Works Department</p>	<p align="center">This continues to be an on-going effort for the Planning and Building Department and the Public Works Department.</p>





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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status (Continued)**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>3. Landslide Hazard Related Actions</b>		
<b>A.</b> Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in these areas by updating landslide mapping data in appropriate City plans and documents.	Planning and Building Department, Public Works Department	This continues to be an on-going effort for the Planning and Building Department and the Public Works Department.
<b>B.</b> Continue to require that geologic/engineering reports be prepared for any proposed construction near landsliding and require mitigation of landslide hazards before issuing any building or grading permits.	Planning and Building Department, Public Works Department	This continues to be an on-going effort for the Planning and Building Department and the Public Works Department.
<b>C.</b> Identify safe evacuation routes in debris flow and landside areas by identifying debris removal resources and in conjunction with the County's Debris Removal Plan.	Planning and Building Department, Public Works Department	This continues to be an on-going effort for the Planning and Building Department and the Public Works Department.



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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status (Continued)**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>4. Wildfire Hazard Related Actions</b>		
<b>A.</b> Continue to secure adequate equipment and attract and retain personnel while collaborating with neighboring jurisdiction and partner agencies to adequately respond to emergencies and incidents in all parts of the city.	Fire Department	This continues to be an on-going effort for the Fire Department.
<b>B.</b> Work cooperatively with other relevant agencies to promote the implementation and awareness of fire prevention programs.	Fire Department	This continues to be an on-going effort for the Fire Department.
<b>C.</b> Require adequate fire flow and emergency access as a condition of approval for discretionary entitlements within Hillside areas.	Planning and Building Department, Fire Department	This continues to be an on-going effort for the Planning and Building Department and the Fire Department.
<b>D.</b> Work with residents to promote fire mitigation and water conservation measures related to drought stress issues.	Planning and Building Department, Fire Department	This continues to be an on-going effort for the Planning and Building Department and the Fire Department.
<b>E.</b> Require fire-resistant building materials for all structures in hillside areas and encourage use of fire-resistant landscaping.	Planning and Building Department, Fire Department	This continues to be an on-going effort for the Planning and Building Department and the Fire Department.



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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status (Continued)**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>5. Human Caused (Hazardous Materials) Related Actions</b>		
<b>A.</b> Enhance the response capabilities of firefighters, police officers, and Public Works field personnel through ongoing training on event specific (human caused) incidents.	Fire Department, Police Department, Public Works Department	Ongoing training for emergency response is built into each of the Department’s yearly training plans.
<b>B.</b> Continue to enhance public safety communications through upgrades and interoperable technologies.	Fire Department, Police Department, Public Works Department	The Police and Fire Departments are continuing the process of updating their communications systems.
<b>C.</b> Coordinate with the Los Angeles County Department of Environmental Health Services on enforcement of State and local statutes and regulations pertaining to hazardous materials/waste storage, use, and disposal.	Planning and Building Department, Fire Department	This coordination is ongoing between the agencies.

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>6. Windstorm Hazard Related Actions</b>		
<b>A.</b> Create local city awareness of tree pruning and Fire Code sections relevant to wind-resistant utility operations by providing information to residents, utility companies, and other involved agencies.	Public Works, Building, Community and Economic Development, Fire	This continues to be an on-going effort between all the Departments involved.
<b>B.</b> Encourage critical facilities (public and private) throughout the city to purchase and/or test backup generators during power failure by providing information guidance.	Fire Department, Police Department, Public Works Department	This continues to be an on-going effort between all the Departments involved.



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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status (Continued)**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>6. Windstorm Hazard Related Actions</b>		
<b>C.</b> Create local city awareness of tree pruning and Fire Code sections relevant to wind-resistant utility operations by providing information to residents, utility companies, and other involved agencies.	Public Works, Building, Community and Economic Development, Fire	This continues to be an on-going effort between all the Departments involved.
<b>D.</b> Encourage critical facilities (public and private) throughout the city to purchase and/or test backup generators during power failure by providing information guidance.	Fire Department, Police Department, Public Works Department	This continues to be an on-going effort between all the Departments involved.

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>7. Drought Hazard Related Actions</b>		
<b>A.</b> Continue to work with other government and other involved agencies to implement water conservation strategies that maximize the use of existing water resources.	City Manager, Planning and Building Department, Public Works Department	This continues to be an on-going effort between all the Departments involved.
<b>B.</b> Work in coordination with the Upper San Gabriel Water District to promote increased groundwater recharge and conjunctive use.	Public Works Department	Public Works staff regularly meet with Water District officials on groundwater recharge issues.
<b>C.</b> Coordinate with the all-water distribution partners on water conservation restrictions and drought conditions.	Public Works Department	This continues to be an on-going effort between all the agencies involved.



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**Table 29 - 2019 South Pasadena Hazard Mitigation Actions and Current Status (Continued)**

2019 Mitigation Action	Responsible Department	Mitigation Status Update
<b>8. Reservoir Failure Hazard Related Actions</b>		
<b>A.</b> Monitor the Los Angeles County Flood Control District's project that will restore reservoir capacity to address the post-Station Fire sediment impacts at Devil's Gate Dam.	Public Works Department	This project has been completed.
<b>B.</b> Monitor the Los Angeles County Flood Control District's project to establish a reservoir configuration that will be more suitable for future routine maintenance activities including sediment management. This will enable the timely removal of sediment in locations, such as those near the dam's valves that are critical to dam safety.	Public Works Department	This project has been completed.



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>1. Multi-Hazard Related Actions</b>						
A. Increase the ability of the city government to serve the community during and after hazard events.	Update Crisis Communication Systems	Promote crisis communication by implementing a Wireless Emergency Alerting (WEA) system.	Grant Funding	Medium	June 30, 2024	Police Chief, Fire Chief
B. Increase the ability of the city government to serve the community during and after hazard events.	Emergency Operations Center Enhancement	Obtain Planet Bid for establishing contracts with vendors during a disaster.	General Fund	Medium	June 30, 2024	Fire Division Chief
C. Increase the ability of the city government to serve the community during and after hazard events.	Emergency Operations Center Enhancement	Initiate regular Emergency Operations Center (EOC) training for Department Directors and staff.	General Fund	Medium	June 30, 2024	Fire Division Chief
D. Increase the ability of the city government to serve the community during and after hazard events.	Coordinate City Planning Efforts	Integrate the City's Mitigation Plan into current capital improvement plans to ensure that development plans include specific strategies for mitigation requirements.	Staff Budget	Medium	June 30, 2026	Community Development Director
E. Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to the City.	Pursuit of Additional Mitigation Funding	Identify and pursue funding opportunities to develop and implement local and city mitigation activities.	Staff Budget	Medium	June 30, 2026	Fire Division Chief



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>1. Multi-Hazard Related Actions</b>						
F. Increase the ability of the City government to serve the community during and after hazard events.	Enhance Emergency Communications	Replacement of the Fire and Police Department's Communications Tower	Grant Funding	Medium	June 30, 2027	Fire Chief, Police Chief





**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>2. Earthquake-Related Actions</b>						
<b>A.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Review Seismic Regulations	Complete an inventory of soft-story buildings in preparation for consideration of future regulations.	General Fund	Medium	January 31, 2024	Community Development Director
<b>B.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Facilities Assessment	Conduct an assessment of City facilities to determine upgrade costs for municipal buildings.	CIP	Medium	June 30, 2027	Public Works Director
<b>C.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Fire Station Upgrade	Replace the Fire Station Bay apparatus doors to ensure operation following a severe seismic event	CIP	High	January 31, 2024	Fire Division Chief



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
D. Increase the ability of the City government to serve the community during and after hazard events.	Ongoing Support of the City's CERT Program	Continue to support the City's Community Emergency Response Team (CERT) of volunteers	Staff Budget, General Fund	Medium	June 30, 2026	Fire Chief



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>3. Severe Storms and Localized Flooding Related Actions</b>						
<b>A.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Mitigating Climate Change	Complete the City’s Climate Action Plan to lessen to assist in mitigating the effects of Severe Storms.	General Fund	Medium	June 30, 2027	Public Works Director
<b>B.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Support of Infrastructure Enhancements	Complete the Lower Arroyo Seco Stormwater Mitigation Projects	CIP	Medium	June 30, 2027	Public Works Director
<b>C.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Support of Infrastructure Enhancements	Complete the Huntington Drive and Green Street Stormwater Mitigation Project.	CIP	Medium	June 30, 2026	Public Works Director



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>3. Severe Storms and Localized Flooding Related Actions</b>						
<b>D.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Support of Infrastructure Enhancements	Complete the Rio Honda Load Reduction Project	CIP	Medium	June 30, 2024	Public Works Director



**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>4. Landslide and Mudflow-Related Actions</b>						
<b>A.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Monitoring of Landslide Planning	Continue to require that geologic/engineering reports be prepared for any proposed construction near landsliding and require mitigation of landslide hazards before issuing any building or grading permits.	Staff Budget	Medium	June 30, 2026	Community Development Director
<b>B.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Monitoring of Landslide Planning	Identify safe evacuation routes in debris flow and landslide areas by identifying debris removal resources in conjunction with the County's Debris Removal Plan.	Staff Budget	Medium	June 30, 2026	Public Works Director



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>5. Wildland and Urban Fire Related Actions</b>						
<b>A.</b> Encourage mitigation activities to increase the disaster resilience of institutions, private companies, and systems essential to a functioning City of South Pasadena.	Wildland Fire Prevention	Research alternative methods of controlling/mitigating hazardous vegetation in the City’s high-hazard brush area.	Staff Budget	Medium	June 30, 2025	Fire Chief
<b>B.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Wildland Fire Prevention	Work with SGVCOG and apply for grants on wildfire mitigation on city-owned vacant lots.	Staff Budget	Medium	January 31, 2024	Fire Chief
<b>C.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Wildland Fire Prevention	Work cooperatively with other agencies to promote the implementation and awareness of fire prevention programs.	Staff Budget	Low	June 30, 2027	Fire Chief



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>5. Wildland and Urban Fire Related Actions</b>						
<b>D.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Wildland Fire Prevention	Work with residents to promote fire mitigation and water conservation measures related to drought stress issues.	Staff Budget	Medium	June 30, 2025	Fire Chief





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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>6. Hazardous Materials and Human Caused Related Actions</b>						
<b>A.</b> Increase the ability of the City government to serve the community during and after hazard events.	Improve Hazmat Response Training	Continue the enhancement of response capabilities of firefighters, police officers, and Public Works field personnel through ongoing training on event-specific (human-caused) incidents.	Staff Budget, General Fund, CalOES Grants	Medium	June 30, 2026	Fire Chief, Police Chief, Public Works Director
<b>B.</b> Increase the ability of the City government to serve the community during and after hazard events.	Review Public Safety Communications Systems	Continue to enhance public safety communications through upgrades and interoperable technologies.	CIP, Grant Funding	Medium	June 30, 2027	Police Chief, Fire Chief



**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>7. Windstorm-Related Actions</b>						
<b>A.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Provide Information on Power Loss Issues to the Community	Encourage critical facilities (public and private) throughout the city to purchase and test backup generators during power failure by providing information guidance.	Staff Budget	Medium	June 30, 2026	Fire Chief
<b>B.</b> Encourage mitigation activities to increase the disaster resilience of the City, institutions, private companies, and systems essential to a functioning City of South Pasadena.	Distribution of Public Information to deal with Wind Related Emergencies	Continue local awareness of tree pruning and Fire Code sections relevant to wind-resistant utility operations by providing information to residents, utility companies, and other involved agencies.	Staff Budget	Medium	June 20, 2026	Fire Chief



**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>8. Drought and Water Resource Related Actions</b>						
<b>A.</b> Increase the ability of the City government to serve the community during and after hazard events.	Ensure Water Resource Sustainability	Implement Integrated Water Resources Plan to address ongoing aging infrastructure challenges, operational and supply sources, and financial strategies for a drought-proof City.	General Fund	Medium	June 30, 2027	Public Works Director
<b>B.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Ensure Water Resource Sustainability	Complete the Westside Reservoir redesign and construction project.	CIP	Medium	June 30, 2027	Public Works Director
<b>C.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Ensure Water Resource Sustainability	Complete the Raymond and Bilikie tanks improvement project.	CIP	Medium	January 31, 2024	Public Works Director



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>8. Drought and Water Resource Related Actions</b>						
<b>D.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.	Ensure Water Resource Sustainability	Complete the SCADA update project	CIP	Medium	June 30, 2027	Public Works Director



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**Table 30 - City of South Pasadena 2023 Hazard Mitigation Actions (Continued)**

Goal	Objective	Mitigation Action	Potential Funding Sources (Tables 35 & 36)	Priority	Target Completion Date	Staff Assigned Table (33)
<b>9. Reservoir Failure-Related Actions</b>						
<p><b>A.</b> Avoid or reduce the potential for loss of life, injury, and economic damage to South Pasadena residents from earthquakes, floods, drought, landslides, and other geological hazards.</p>	<p>Ongoing Monitoring of Reservoir Flooding Issues</p>	<p>Monitor the Los Angeles County Flood Control District’s project to establish a reservoir configuration that will be more suitable for future routine maintenance activities, including sediment management. This will enable the timely removal of sediment in locations, such as those near the dam’s valves, critical to dam safety.</p>	<p>Staff Budget</p>	<p>Low</p>	<p>June 30, 2027</p>	<p>Public Works Director</p>



**5.4 Planning and Regulatory Capabilities Assessment**

This capability assessment is designed to identify existing local agencies, personnel, planning tools, public policy and programs, technology, and funds to support hazard mitigation activities and strategies outlined in this LHMP. To create this capability assessment, the Technical Advisory Committee collaborated to identify current local capabilities and mechanisms available to the City for reducing damage from future natural hazard events. These plans and resources were reviewed while developing the Local Hazard Mitigation Plan and summarized below.

**Key Resources**

The City of South Pasadena has departments with resources to support mitigation actions. These departments offer various planning, technical, policy, and staffing resources, summarized below.

**Table 31 - City of South Pasadena Planning Capabilities Assessment**

Type of Resource	Resource Name	Ability to Support Mitigation	Web Address (URL)
<b>Planning Department</b>			
Personnel Resource	Community Development Department	The Planning & Building Department provides staff services to the Planning and Cultural Heritage Commissions and the Design Review Board. The planning staff administers land use and development regulations, processes land use permits, and does long-range land use planning. In addition, the Department is responsible for the planning and development review of the built environment in South Pasadena.	<a href="https://www.southpasadenaca.gov/government/departments/planning-and-building/www.ci.south-pasadena.ca.us/index.aspx?page=118">https://www.southpasadenaca.gov/government/departments/planning-and-building/www.ci.south-pasadena.ca.us/index.aspx?page=118</a>
Policy Resource	Zoning Ordinance	The Zoning Ordinance is the primary tool to implement the City's General Plan. It sets land use regulations and the zoning map for the city. Mitigation actions outlined in this Plan can be adopted as land use/development regulations.	<a href="http://www.codepublishing.com/CA/SouthPasadena/#!/SouthPasadena36/SouthPasadena36.html">http://www.codepublishing.com/CA/SouthPasadena/#!/SouthPasadena36/SouthPasadena36.html</a>



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**Table 31 - City of South Pasadena Planning Capabilities Assessment (Continued)**

Type of Resource	Resource Name	Ability to Support Mitigation	Web Address (URL)
<b>Building Department</b>			
Personnel Resource	Building Official	The role of the Building Division is to enforce the provisions of the Building Code.	<a href="http://www.southpasadenaca.gov/index.aspx?page=119">http://www.southpasadenaca.gov/index.aspx?page=119</a>
Policy Resource	Inspections & Permit	Building permits ensure that zoning requirements, as well as fire and structural safety standards, are met.	<a href="https://www.southpasadenaca.gov/government/departments/planning-and-building/building-division">https://www.southpasadenaca.gov/government/departments/planning-and-building/building-division</a>
<b>City Council</b>			
Policy Resource	Policy Approval	Policy legislation and implementation	<a href="http://www.southpasadenaca.gov/index.aspx?page=141">http://www.southpasadenaca.gov/index.aspx?page=141</a>
<b>City Administration</b>			
Personnel Resource	City Manager	Supports the development and implementation of this Local Hazard Mitigation Plan by allocating the appropriate personnel and resources.	<a href="https://www.southpasadenaca.gov/government/departments/city-manager-s">https://www.southpasadenaca.gov/government/departments/city-manager-s</a>
Financial Resource	Finance	Budgeting and Risk Management for City owned facilities.	<a href="http://www.southpasadenaca.gov/index.aspx?page=108">http://www.southpasadenaca.gov/index.aspx?page=108</a>
<b>Public Works Department</b>			
Personnel Resource	Public Works Director	Participates in the development and implementation of this Hazard Mitigation Plan.	<a href="http://www.southpasadenaca.gov/index.aspx?page=134">http://www.southpasadenaca.gov/index.aspx?page=134</a>
Technical and Policy Resource	Maintenance	Provides maintenance and improvement of the city's streets, facilities, stormwater, and parks.	<a href="http://www.southpasadenaca.gov/index.aspx?page=354">http://www.southpasadenaca.gov/index.aspx?page=354</a>
Personnel Resource	Engineering	Engineering activities include the programming, design, and construction of the City's capital projects.	<a href="http://www.southpasadenaca.gov/index.aspx?page=134">http://www.southpasadenaca.gov/index.aspx?page=134</a>





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**Table 31 - City of South Pasadena Planning Capabilities Assessment (Continued)**

Type of Resource	Resource Name	Ability to Support Mitigation	Web Address (URL)
<b>Police Department</b>			
Personnel Resource	Police Chief	Provides law enforcement services for the City of South Pasadena.	<a href="https://www.southpasadenaca.gov/government/departments/police">https://www.southpasadenaca.gov/government/departments/police</a>
<b>Fire Department</b>			
Personnel Resource	Fire Chief	Coordinates emergency response, fire prevention education, CERT training, and wildfire education and prevention.	<a href="https://www.southpasadenaca.gov/government/departments/fire/administration">https://www.southpasadenaca.gov/government/departments/fire/administration</a>
Plan Resource	Hazardous Waste	Dealing with hazardous waste materials within the city.	<a href="https://www.southpasadenaca.gov/government/departments/fire/hazardous-waste">https://www.southpasadenaca.gov/government/departments/fire/hazardous-waste</a>
Personnel Resource	Operations Division	Is charged with the responsibility of providing fast and efficient emergency response to fires, hazardous conditions, rescues, illnesses, or any other conditions where the health, safety, and welfare of the public is in jeopardy.	<a href="https://www.southpasadenaca.gov/government/departments/fire/operations">https://www.southpasadenaca.gov/government/departments/fire/operations</a>
Personnel Resource	Emergency Services	Coordinates with City staff on emergency preparedness, response, and mitigation activities.	<a href="https://www.southpasadenaca.gov/residents/disaster-preparedness">https://www.southpasadenaca.gov/residents/disaster-preparedness</a>
Personnel Resource	Public Education	Educates residents on hazard awareness, prevention, and preparedness.	<a href="https://www.southpasadenaca.gov/government/departments/fire/fire-prevention">https://www.southpasadenaca.gov/government/departments/fire/fire-prevention</a>
Policy Resource	Building Inspections and Permits	Provides reoccurring fire prevention inspections of all buildings in the city. The Department also provides plan check and permit functions for commercial development addressing Fire Code Standards.	<a href="https://www.southpasadenaca.gov/government/departments/fire/fire-prevention">https://www.southpasadenaca.gov/government/departments/fire/fire-prevention</a>



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**Table 32 - Outside Agency Capabilities**

Type of Resource	Resource Name	Ability to Support Mitigation	Web Address (URL)
<b>Outside Agencies Within Los Angeles County</b>			
<b>Upper San Gabriel Valley Municipal Water District</b>			
Plan Resource	Water Provider	Water supply planning.	<a href="http://upperdistrict.org/">http://upperdistrict.org/</a>
<b>Metropolitan Water District</b>			
Plan Resource	Water Provider	Wholesale water provider for the Southern California region.	<a href="http://www.mwdh2o.com/">http://www.mwdh2o.com/</a>
<b>Los Angeles County Flood Control District</b>			
Technical Resource	Flood Control	Organization charged with coordinating flood control issues in Los Angeles County.	<a href="http://ladpw.org/LACFCD/index.cfm">http://ladpw.org/LACFCD/index.cfm</a>
<b>Sanitation Districts of Los Angeles County</b>			
Technical Resource	Wastewater Collection and Treatment	The Sanitation Districts provide wastewater and solid waste management for over half the population of Los Angeles County.	<a href="https://dpw.lacounty.gov/landing/wr/sewer/wwTreatment.cfm">https://dpw.lacounty.gov/landing/wr/sewer/wwTreatment.cfm</a>
<b>Los Angeles County Office of Emergency Management</b>			
Plan Resource	Operational Area Emergency Management Plan	Overall emergency management plan for the Los Angeles County Operational Area.	<a href="https://ceo.lacounty.gov/emergency-management/">https://ceo.lacounty.gov/emergency-management/</a>
<b>Southern California Earthquake Center</b>			
Technical Resource	Earthquake Planning	Regional Earthquake planning and technical resource organization.	<a href="https://www.scec.org/">https://www.scec.org/</a>



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**Table 32 - Outside Agency Capabilities (Continued)**

Type of Resource	Resource Name	Ability to Support Mitigation	Web Address (URL)
<b>State Agencies</b>			
<b>California Office of Emergency Services (CalOES)</b>			
Plan Resource	Planning Organization	State of California’s emergency management agency. Assists with mitigation plans and training.	<a href="http://www.caloes.ca.gov/home">http://www.caloes.ca.gov/home</a>
<b>California Department of Transportation (CalTrans)</b>			
Technical Resource	Transportation Agency	State of California’s transportation agency. Assists with emergency management plans.	<a href="http://www.dot.ca.gov/">http://www.dot.ca.gov/</a>
<b>California Department of Forestry and Protection (CalFire)</b>			
Technical Resource	Fire Protection Agency	The California Department of Forestry and Fire Protection protects over 31 million acres of California's privately-owned wildlands.	<a href="http://www.fire.ca.gov/">http://www.fire.ca.gov/</a>
<b>California Department of Water Resources Control Board (DWRCB)</b>			
Technical Resource	Water Regulatory Agency	The Department of Water Resources manages California's water resources in cooperation with other agencies.	<a href="http://www.water.ca.gov/">http://www.water.ca.gov/</a>
<b>California Department of Conservation</b>			
Technical Resource	Conservation Agency	Provides services and information that promote environmental health, economic vitality, informed land-use decisions, and sound management of our state's natural resources.	<a href="http://www.conservation.ca.gov/">http://www.conservation.ca.gov/</a>



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**Table 32 - Outside Agency Capabilities (Continued)**

Type of Resource	Resource Name	Ability to Support Mitigation	Web Address (URL)
<b>Federal Agencies</b>			
<b>Federal Emergency Management Agency Region IX (FEMA)</b>			
Plan Resource	Planning Organization	Responsible for the federal government’s response to disasters.	<a href="https://www.fema.gov/fema-region-ix-arizona-california-hawaii-nevada-pacific-islands">https://www.fema.gov/fema-region-ix-arizona-california-hawaii-nevada-pacific-islands</a>
<b>Federal Emergency Management Agency Mitigation Division (FEMA)</b>			
Plan Resource	Planning Organization	FEMA’s division that assists with mitigation plans and training.	<a href="https://www.fema.gov/hazard-mitigation-assistance">https://www.fema.gov/hazard-mitigation-assistance</a>
<b>United States Geological Survey (USGS)</b>			
Technical Resource	Geological Agency	The Agency provides reliable scientific information to describe and understand the Earth and to minimize the loss of life and property from natural disasters.	<a href="https://www.usgs.gov/">https://www.usgs.gov/</a>
<b>National Weather Service (NWS)</b>			
Technical Resource	Weather Agency	It is responsible for observing and reporting the weather and issuing forecasts and warnings of weather and floods in the interest of national safety and the economy.	<a href="http://www.weather.gov/">http://www.weather.gov/</a>
<b>US Army Corps of Engineers (USACE)</b>			
Technical Resource	Engineering Agency	Although generally associated with dams, canals, and flood protection in the United States, USACE is involved in many public works projects worldwide.	<a href="http://www.usace.army.mil/">http://www.usace.army.mil/</a>



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**5.5 Organizational Capabilities Assessment**

The following summarizes the City of South Pasadena’s organizational capabilities in terms of the City's resources and allocated spending. The General Fund and Enterprise accounts are the primary sources of the City’s financial resources. The City has allocated most of these financial resources to the City departments listed in the table below. These departments are all relevant for implementing hazard mitigation actions. The functions of City departments include:

**Table 33 - City of South Pasadena Department Responsibilities**

Department	Responsibilities
<b>City Manager</b>	The Council appoints the City Manager to oversee the activities of the City. The City Manager serves as the Chief Administrative Officer, ensuring that the policies of the Mayor and City Council are executed effectively and efficiently. Specific areas of responsibility include oversight of eight operating departments, public information and community engagement, legislative affairs, economic development, following up on citizen concerns, providing recommendations to promote organizational efficiency, and overseeing the development and presentation of the annual budget.
<b>City Clerk</b>	The City Clerk’s Office conducts municipal elections, coordinates City Council meetings and agendas, is the custodian of City public records, maintains the City’s Municipal Code, and coordinates the recruitment process for the City’s advisory committees.
<b>Human Resources Division</b>	The Human Resources Office is a Division of the Management Services Department, dedicated to responsible human resource management by recruiting qualified individuals for a productive workplace; providing a safe work environment; maintaining equitable compensation systems; and committing to the personal and professional development of the employees through meaningful training and recognition programs.
<b>Management Services</b>	Management Services is responsible for Information Technology, Grants Management, and Special Projects for the City.
<b>Finance Department</b>	The Finance Department provides various services to residents, businesses, and other departments in the City. The Finance Director coordinates the activities of the Department's various program areas and serves as the primary contact point for the City Council, other City departments, and the general public. The Finance Director is responsible for preparing the City's Annual Budget and budgetary monitoring throughout the year.



**Table 33 - City of South Pasadena Department Responsibilities (Continued)**

Department	Responsibilities
<p><b>Fire Department</b></p>	<p>The Fire Department is an all-risk emergency services agency. Department personnel is trained to handle responses such as structure, wildland, vehicle fires, hazardous materials releases, rescues, and service calls. In addition, it provides advanced life support and medical transport. The Fire Prevention Bureau works to prevent or reduce fire losses and ensure compliance with applicable codes and ordinances. The Department also oversees the City’s emergency management program that coordinates with all City Departments to strengthen the City's ability to prepare for, mitigate, respond to, and recover from any disaster. The Fire Department is the lead department to coordinate all emergency management activities for the City.</p>
<p><b>Library Department</b></p>	<p>The Library is governed by the Library Board of Trustees, whose members are appointed by the City Council. Library staff oversees a collection of approximately 120,000 titles in various formats, the circulation of more than 340,000 items, and over 233,000 visits. The Library has free high-speed Wi-Fi and computer workstations for children, teens, and adults.</p>
<p><b>Public Works Department</b></p>	<p>The Public Works Department provides for the efficient operation of public works systems and programs such as water system management, sewer maintenance, waste management and recycling, water conservation, traffic management, street design and maintenance, maintenance of public facilities and parks, and graffiti removal while protecting the environment and responding to the needs of the citizens. Public Works Administration coordinates all activities of the City’s Capital Improvement Program. It also reviews plans, issues permits, and provides inspections for private construction projects involving grading or public right-of-way work.</p>
<p><b>Police Department</b></p>	<p>The Police Department comprises the Field Operations Division, which provides front-line police services to the City, and the Traffic Unit, which conducts traffic enforcement, community education, and collision investigation. The Department’s Detective Bureau is responsible for conducting follow-up investigations on criminal cases. The Support Services Division is made up of the Communications Division and the Records Division.</p>
<p><b>Community Development</b></p>	<p>The Community Development Department provides staff services to the Planning, Cultural Heritage Commission and the Design Review Board. The planning staff administers land use and development regulations, processes land use permits, and does long-range land use planning. In addition, the Department is responsible for the planning and development review of the built environment in South Pasadena.</p>
<p><b>Community Services</b></p>	<p>The Community Services Department oversees the City’s parks and museum, various recreation and youth programs, Citywide special events, senior services, and the Dial-a-Ride program.</p>





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**Capital Improvement Program**

In accordance with section 65401 of the California Government Code, a City that has adopted a General Plan and recommends, prepares plans for, or constructs major public works, shall also prepare a coordinated program of proposed public works for the ensuing fiscal year. The CIP for fiscal year (FY) 2022-2023 is included in the City’s Preliminary FY 2022-2023 Budget. In addition, a Five-Year CIP is included as an attachment to the Budget, which outlays planned physical improvements, such as buildings, transportation, street projects, parks, water & sewer facilities, etc. These projects are recommended for adoption in future proposed budgets for fiscal years 2023-2024 through 2026-2027. This CIP does not include costs for operational functions, programs, and routine maintenance activities, as is typical of CIPs. Furthermore, the attached five-year CIP includes references to the City’s current General Plan to demonstrate that the proposed projects support, promote, or implement the statements, goals, policies, and programs in the General Plan. **Table 34** shows each line item in the capital improvement program.

**Table 34 - City of South Pasadena Capital Improvement Program Projects FY 2022 to FY 2027**

Project Name	Appropriated 21-22	Carryover From 21-22	Proposed 22-23	Proposed 23-24	Proposed 24-25	Proposed 25-26	Proposed 26-27	Total
<b>GENERAL BUILDINGS &amp; FACILITIES</b>								
Computerized Maintenance Mgmt. System	\$150,000	\$150,000	-	-	-	-	-	\$150,000
Citywide Facilities Assessment	\$100,000	\$100,000	\$100,000	-	-	-	-	\$200,000
Citywide Facilities Repairs	-	-	\$150,000	\$250,000	\$500,000	\$500,000	\$500,000	\$1,900,000
825 Mission Yard Security Gates	\$160,000	\$160,000	-	-	-	-	-	\$160,000
War Memorial HVAC Repairs	-	-	\$25,000	-	-	-	-	\$25,000
<b>Total</b>								<b>\$2,435,000</b>
<b>COMMUNITY DEVELOPMENT</b>								
CD Permit Management Software	-	-	\$310,000	\$140,000	-	-	-	\$450,000
CD Digital Records Scanning & Mgmt.	-	-	\$45,000	-	-	-	-	\$45,000
<b>Total</b>								<b>\$495,000</b>
<b>INFORMATION TECHNOLOGY</b>								
VoIP Phone / Network System	-	-	\$200,000	\$200,000	-	-	-	\$400,000
Customer Care System	-	-	-	-	\$25,000	-	-	\$25,000
Agenda Management System	-	-	-	-	\$25,000	-	-	\$25,000
<b>Total</b>								<b>\$450,000</b>
<b>LIBRARY</b>								
Security Camera System	\$20,000	\$20,000	-	-	-	-	-	\$20,000
HVAC Repairs	-	-	\$25,000	-	-	-	-	\$25,000
Northeast Ramp Lighting	-	-	\$20,000	-	-	-	-	\$20,000



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**Table 34 - City of South Pasadena Capital Improvement Program Projects FY 2022 to FY 2027 (Continued)**

Project Name	Appropriated 21-22	Carryover From 21-22	Proposed 22-23	Proposed 23-24	Proposed 24-25	Proposed 25-26	Proposed 26-27	Total
<b>LIBRARY</b>								
HVAC Children’s Room	-	-	-	\$12,000	-	-	-	\$12,000
Repair Children’s Room Windows	-	-	-	\$10,000	-	-	-	\$10,000
Radio Frequency Identification System	-	-	-	\$160,000	-	-	-	\$160,000
Exterior Park Lighting	-	-	-	\$220,000	-	-	-	\$220,000
Public Restrooms Expansion & Remodel	-	-	-	\$240,000	-	-	-	\$240,000
Emergency Solar Backup & Storage	-	-	-	-	\$475,000	-	-	\$475,000
Cooling Center Backup HVAC	-	-	-	-	\$20,000	-	-	\$20,000
<b>Total</b>								<b>\$1,202,000</b>
<b>COMMUNITY SERVICES &amp; PARKS</b>								
Grevelia & Berkshire Pocket Parks	\$178,025	\$178,025	\$825,000	-	-	-	-	\$1,003,025
Golf Course & Driving Range Net Replace	\$100,000	-	\$750,000	-	-	-	-	\$750,000
War Memorial Sound System	-	-	\$50,000	-	-	-	-	\$50,000
Recreation Facilities Key System	-	-	\$75,000	-	-	-	-	\$75,000
Parks Master Plan	-	-	-	\$150,000	-	-	-	\$150,000
Snake Trail Improvements	-	-	-	\$50,000	\$300,000	-	-	\$350,000
Garfield Park Fitness Equipment	-	-	-	\$100,000	-	-	-	\$100,000
Arroyo Park Fitness Equipment	-	-	-	\$100,000	-	-	-	\$100,000
Eddie Park Restrooms	-	-	-	\$100,000	-	-	-	\$100,000
Orange Grove Gazebo	-	-	-	-	\$150,000	-	-	\$150,000
Orange Grove Park Playground	-	-	-	-	\$200,000	-	-	\$200,000
Arroyo Walking Trail	-	-	-	-	\$200,000	\$150,000	-	\$350,000
Garfield Gazebo	-	-	-	-	-	\$200,000	-	\$200,000
Eddie Park Playground Replacement	-	-	-	-	-	\$150,000	-	\$150,000
Arroyo Park Sports Complex	-	-	-	-	-	-	\$750,000	\$750,000
Orange Grove Sports Complex	-	-	-	-	-	-	\$750,000	\$750,000
<b>Total</b>								<b>\$5,753,025</b>
<b>PUBLIC SAFETY (POLICE &amp; FIRE)</b>								
PD Front Counter/Lobby Remodel	-	-	\$16,000	-	-	-	-	\$16,000
PD Locker Room Remodel	-	-	\$180,000	-	-	-	-	\$180,000
PD Briefing/Training Room Update	-	-	\$18,000	-	-	-	-	\$18,000
PD Interior Paint, Drywall, & Millwork	-	-	\$12,000	-	-	-	-	\$12,000
Fire Station Bay Apparatus Door	-	-	\$80,000	-	-	-	-	\$80,000
<b>Total</b>								<b>\$306,000</b>



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**Table 34 - City of South Pasadena Capital Improvement Program Projects FY 2022 to FY 2027 (Continued)**

Project Name	Appropriated 21-22	Carryover From 21-22	Proposed 22-23	Proposed 23-24	Proposed 24-25	Proposed 25-26	Proposed 26-27	Total
<b>Sewer</b>								
System Repair & Rehabilitation	-	-	\$500,000	\$810,000	\$878,000	\$820,000	\$1,014,500	\$4,022,500
<b>Total</b>								<b>\$4,022,500</b>
<b>Stormwater</b>								
Rio Honda Load Reduction	-	-	\$5,000	\$50,000	-	-	-	\$55,000
Arroyo Seco, San Rafael, San Pascual	-	-	\$1,214,953	\$3,528,202	\$3,528,202	-	-	\$8,271,357
Lower Arroyo Seco Projects	-	-	-	\$750,000	\$760,000	\$5,800,000	\$17,000,000	\$24,310,000
Huntington Drive Green Street	-	-	-	\$250,000	\$2,000,000	\$3,000,000	-	\$5,250,000
Camino Verde Pocket Park	-	-	-	-	\$100,000	\$600,000	\$900,000	\$1,600,000
<b>Total</b>								<b>\$39,486,357</b>
<b>STREETS</b>								
Street Repavement & Repairs	\$2,313,936	\$2,313,936	\$1,667,093	\$1,800,000	\$2,000,000	\$2,000,000	\$2,000,000	\$11,781,026
Sidewalk Replacement & Repairs	\$216,597	\$216,597	\$105,126	\$120,000	\$120,000	\$120,000	\$120,000	\$801,723
<b>Total</b>								<b>\$12,582,752</b>
<b>SUSTAINABILITY</b>								
Climate Action Plan	\$120,000	\$120,000	-	\$100,000	\$100,000	\$100,000	\$100,000	\$520,000
Civic Center/City Hall EV Charging Sys	-	-	\$350,000	-	-	-	\$150,000	\$500,000
Civic Center/Mound Solar Panels	-	-	-	-	-	-	-	-
Arroyo Park EV Charging Systems	-	-	\$50,000	-	-	-	\$50,000	\$100,000
Urban Forest Master Plan	-	-	-	\$150,000	-	-	-	\$150,000
<b>Total</b>								<b>\$1,270,000</b>
<b>TRANSPORTATION &amp; TRAFFIC</b>								
Fremont/Huntington Project	-	-	\$475,000	\$3,400,000	\$5,200,000	\$4,000,000	\$3,000,000	\$16,075,000
North-South Corridor ITS Deployment	-	-	\$867,331	\$282,669	\$5,000,000	\$5,000,000	-	\$11,150,000
Rectangular Rapid Flashing Beacons	\$43,540	\$43,540	\$238,465	-	-	-	-	\$282,005
Grevelia and Fair Oaks Avenue	-	-	\$50,000	\$150,000	-	-	-	\$200,000
Pedestrian Crossing Devices	-	-	\$200,000	\$122,624	-	-	-	\$322,624
Garfield and Monterey Signal & Bicycle	-	-	-	\$100,000	\$300,000	-	-	\$400,000
Columbia Striping & Signals Orange Grove	-	-	-	\$50,000	\$250,000	-	-	\$300,000
Orange Grove Avenue Project	-	-	-	\$50,000	\$100,000	\$350,000	-	\$500,000
Mission Meridian-El Centro Bollard System	-	-	-	\$50,000	\$200,000	-	-	\$250,000
Citywide Mobility Plan Update	-	-	-	\$150,000	-	-	-	\$150,000
Fair Oaks / 110 Interchange Controller	-	-	-	\$750,000	\$1,500,000	\$2,000,000	\$2,500,000	\$6,750,000
Traffic Signal Controller Replacement	-	-	-	-	-	\$300,000	\$300,000	\$600,000
<b>Total</b>								<b>\$36,979,629</b>



**DRAFT CITY OF SOUTH PASADENA DRAFT  
LOCAL HAZARD MITIGATION PLAN**

**SECTION FIVE**

**Table 34 - City of South Pasadena Capital Improvement Program Projects FY 2022 to FY 2027 (Continued)**

Project Name	Appropriated 21-22	Carryover From 21-22	Proposed 22-23	Proposed 23-24	Proposed 24-25	Proposed 25-26	Proposed 26-27	Total
<b>Water</b>								
Water Main Pipeline Repairs	\$1,134,628	\$1,134,628	\$1,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$10,134,628
Raymond & Bilikie Tanks Improvements	\$80,000	\$80,000	\$40,000	-	-	-	-	\$120,000
Westside Reservoir Design/Construction	\$550,000	\$550,000	-	-	\$2,000,000	\$7,000,000	\$6,000,000	\$15,550,000
Water Facility Site Improvements	-	-	\$88,000	\$50,000	\$250,000	\$250,000	\$250,000	\$888,000
Advanced Metering Infrastructure	-	-	\$150,000	\$300,000	\$500,000	\$1,000,000	\$1,000,000	\$2,950,000
SCADA Upgrade	-	-	-	-	\$150,000	\$150,000	\$150,000	\$450,000
<b>Total</b>								<b>\$30,092,628</b>
<b>ALL PROJECTS</b>								
<b>Total</b>	<b>\$5,166,726</b>	<b>\$5,066,726</b>	<b>\$9,881,968</b>	<b>\$16,745,495</b>	<b>\$29,031,202</b>	<b>\$35,490,000</b>	<b>\$38,534,500</b>	<b>\$269,499,72</b>



City Funding Sources

There may be funding sources available in the City's regularly budgeted accounts. Examples of these are noted in Table 36.

Table 35 - Internal City Funding Sources

City Fund	Potential Mitigation Actions
General Fund	Ongoing Programs
Capital Improvement Program	Capital Projects
Grant Funding	New Projects and Programs
Enterprise Accounts	Ongoing Programs
Bond Measures	Capital Projects and Programs

As noted in 5.1.3, Hazard Mitigation Benefit-Cost Review, there are potential outside funding sources for mitigation measures. These include:

Table 36 - Potential Outside Funding Sources

Acronym	Funding Source Name
HMGP	Hazard Mitigation Grant Program (FEMA)
CDBG	Community Development Block Grants
FMA	Flood Mitigation Assistance (FEMA)
FHA	Federal Highway Administration
CalOES	California Office of Emergency Service
CalTrans	California Department of Transportation
PDM	Pre-Disaster Mitigation (FEMA)

5.6 Implementation Through Existing Programs

The effectiveness of the City's non-regulatory LHMP depends on implementing the Plan and incorporating the outlined mitigation action items into existing City plans, policies, and programs. The Plan includes a range of action items that, if implemented, would reduce loss from hazard events. Together, the mitigation action items in the Plan provide the framework for activities that the City can choose to implement over the next five years. Accordingly, the City has prioritized the Plan's goals and identified actions that will be implemented (resources permitting) through existing plans, policies, and programs.

The Fire Department has taken on the responsibility for overseeing the Plan's implementation and maintenance through the City's existing programs. The City's Emergency Manager will be responsible for facilitating LHMP implementation and maintenance meetings. Although the Fire Department will have primary responsibility for review, coordination, and promotion, plan



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implementation and evaluation will be a shared responsibility among all departments identified in the mitigation action plan. The City will work with other Regional organizations to ensure consistency with all relevant plans.

### **5.7 Incorporation Into Existing Planning Mechanisms**

As stated in **Section 3.4**, information on hazards, risk, vulnerability, and mitigation contained in this Plan is based on information from similar planning documents used by the City. The General Plan and the LHMP work together to reduce risk exposure to the City. Many of the ongoing recommendations identified in the mitigation strategy are programs recommended by the General Plan, Strategic Plan, and other adopted plans. As used in the preparation of the LHMP, the City will continue to coordinate the Plan's recommendations with other planning processes and programs, which include:

- City of South Pasadena General Plan
- City of South Pasadena Strategic Plan
- City of South Pasadena Capital Improvement Program
- South Pasadena Building Codes
- South Pasadena Building Design Guidelines
- South Pasadena Emergency Operations Plan
- Los Angeles County Emergency Management Plan



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## **Section Six - Plan Maintenance Process**

This Chapter identifies the formal process to ensure that the City of Pasadena’s LHMP remains an active and relevant document. The Plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an update every five years.

This chapter describes how the City will integrate public participation throughout the plan maintenance and implementation process. In addition, the Plan's format allows the City to readily update sections when new data becomes available, resulting in a Plan that will remain current and relevant to South Pasadena.

### **6.1 Monitoring, Evaluating, and Updating the Plan**

#### **Coordinating Body**

The City of South Pasadena’s Technical Advisory Committee (TAC) will be responsible for the maintenance of this LHMP. The Fire Department will lead in LHMP maintenance issues by coordinating the maintenance of this plan, undertaking the formal review process, and revising the LHMP.

#### **Convener**

The City’s assigned Emergency Manager will facilitate the TAC meetings and assign tasks such as updating and presenting the Plan to other Departments, Stakeholder Groups, and elected officials. Plan implementation and evaluation will be a shared responsibility among all of the TAC.

#### **Monitoring**

It will be the responsibility of the Division Chief to track the implementation of the LHMP and report back to the TAC with their findings. As a part of the yearly budget process occurring at the beginning of the calendar year, they will evaluate the progress of each action item with the department responsible for its implementation. Refer to **Sections 6.2 and 6.3**. In addition, they will coordinate with the Fire Chief on an ongoing basis on the Plan’s progress. Finally, public input will be obtained by consulting with the City’s Planning Commission, Public Safety Commission, and the Natural Resources and Environmental Commission.

#### **Evaluation**

The minimum task of the annual hazard mitigation planning team meeting will be to evaluate the Plan's progress and incorporate the actions into other planning documents. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the City.
- Review of successful mitigation initiatives identified in the Plan.
- A brief discussion about why targeted mitigation strategies were not completed.



- Re-evaluation of the Mitigation Actions to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project due to funding availability).
- Review by the City's TAC on an annual basis.
- Recommendations for new mitigation actions.
- Changes in, or potential for, new funding options/grant opportunities.
- Integration of new GIS data and maps that can be used to update the Plan.
- Evaluation of other planning programs or initiatives within the City involving hazard mitigation.

## **6.2 Method and Schedule for Updating the Plan Within Five Years**

Section 201.6.(d)(3) of Title 44 of the Code of Federal Regulations requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval to remain eligible for benefits awarded under the Disaster Mitigation Act (DMA). The City intends to update the Plan on a five-year cycle from the date of plan adoption. It is anticipated that this update process will occur one year before the expiration of the existing plan. This cycle may be accelerated to less than five years based on the following triggers:

- A Presidential Disaster Declaration that impacts the City.
- A hazard event that causes a significant amount of damage.

The update process will intend to add new planning process methods, community profile data, hazard data and events, vulnerability analyses, mitigation actions, and goals to the adopted plan so that the Plan will always be current and up to date. Based on the needs identified by the planning team, the update will, at a minimum, include the elements below:

- The update process will be convened through the Technical Advisory Committee and reviewed by the Division Chief to ensure consistency between City plans.
- The hazard risk assessment will be reviewed and updated annually using the best available information and technologies.
- Critical structures and mapping evaluation will be updated and improved as funding becomes available.
- The mitigation actions will be reviewed and revised for any actions completed, deferred, or changed to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate.
- The draft update will be sent to appropriate agencies for comment.
- The public will be allowed to comment before adoption.
- The South Pasadena City Council will adopt the updated Plan.





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### 6.3 Five-Year LHMP Update Timeline

Based on a midyear 2023 CalOES and FEMA approval date.

- March 2024 - LHMP Progress Report and October 2024 Mitigation Action review
- March 2025 - LHMP Progress Report and October 2025 Mitigation Action review
- March 2026 - LHMP Progress Report and October 2026 Mitigation Action review
- March 2027 - LHMP Progress Report and Plan Update Implementation
- October 2027 - Mitigation Action Review
- January 2028 - Submit Update LHMP to CalOES and FEMA
- March 2028 - LHMP Progress Report
- Summer 2028 - Implementation of approved LHMP

### 6.4 Annual Progress Report Form

As part of the Plan Maintenance Process for the LHMP, the TAC will convene to conduct an annual review to monitor the progress in implementing the LHMP. The LHMP Progress Report Form has been developed for this purpose and will be completed annually.

The **LHMP Progress Report Form (Section 6.8)** will provide the basis for possible changes to the overall LHMP. The City will be able to refocus on any new or more threatening hazards. In addition, this will allow the City to make any necessary adjustments to or changes in resource allocations and engage additional support for the LHMP implementation if warranted. The findings will be reviewed by the Fire Division Chief and used for the next plan update.

### 6.5 Adoption

The City of South Pasadena's City Council is responsible for adopting the Plan. This formal adoption should take place every five years. Once the Plan has been adopted, the City will be responsible for final submission to the California Office of Emergency Services (CalOES). CalOES will then submit the Plan to the Federal Emergency Management Agency (FEMA) for final review and approval.

### 6.6 Continued Public Involvement

The public will continue to be apprised of the LHMP actions through the City's website and by providing copies of the progress report to the public. Upon initiating the LHMP update process, a new public involvement strategy will be developed based on guidance from the planning team. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of local media outlets within the area and the City's website.



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### **6.7 Point of Contact**

Division Chief Eric Zanteson  
City of South Pasadena Fire Department  
817 Mound Avenue  
South Pasadena, CA 91030  
(626) 403-7300



### 6.8 LHMP Annual Progress Report Form

#### LHMP Annual Progress Report Form

Date:

Name of Person Completing the Report:

**Summary of Progress**

Have any new hazard/disaster events occurred during the reporting period? If so, list the event(s).

To your knowledge, did anyone from the public comment on the plan during the reporting period? If so, list the comments.

Do the plan's goals, objectives, and mitigation actions address current and expected conditions? If not, please explain further:

Were any mitigation projects identified in the LHMP implemented during the reporting period? If so, list the projects.

What obstacles, problems, or delays did any current or ongoing mitigation projects may encounter? How were the problems solved?

Are current resources appropriate for implementing the Plan?	Y	N
Have the outcomes occurred as expected?	Y	N
Have outside agencies participated as proposed?	Y	N

Were shortcomings identified? What can the City do to get things back on track?

Have there been changes in development trends that could create additional risks? If so, please explain.



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**SECTION SIX**

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## Section Seven - Glossary of Acronyms

### Commonly Used Emergency Management Acronyms

A	
AAR	After-Action Report
AAR / IP	After-Action Report / Improvement Plan
AC	Area Command
ADA	Americans with Disabilities Act
ALS	Advanced Life Support
AQI	Air Quality Index
ARC	American Red Cross
ARES	Amateur Radio Emergency Services
ASL	Above Mean-Sea-Level
AWMC	Agricultural Water Management Council
B	
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BLS	Basic Life Support
BRIC	Building Resilient Infrastructure and Communities
C	
C&O	Concept and Objectives
Cal Fire	California Department of Forestry and Fire Protection
Cal OES	California Office of Emergency Services
Cal OSHA	California Occupational Safety and Health Administration
CCR	California Code of Regulations (State Water Board regulations are in Title 23)
CDC	Centers for Disease Control
CDEC	California Data Exchange Center
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CERT	Community Emergency Response Team
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CHP	California Highway Patrol
CMUA	California Municipal Utilities Association



**DRAFT CITY OF SOUTH PASADENA DRAFT  
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**SECTION SEVEN**

C	
COOP	Continuity of Operations Plan
COG	Continuity of Government
COP	Common Operating Picture
CPG	Comprehensive Planning Guide
CRT	Crisis Response Team
CVP	Central Valley Project
CVRWQCB	Central Valley Water Quality Control Board
D	
DCF	Disaster Control Facility
DHS	United States Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DMP	Debris Management Plan
DOC	Department Operations Center
DOD	United States Department of Defense
DOJ	United States Department of Justice
DWR	Department of Water Resources
E	
EAP	Emergency Action Plan
EEG	Exercise Evaluation Guide
EF(#)	Enhanced Fujita Scale (followed by a #)
EHPSM	Environmental and Historic Preservation Screening Memo
EMA	Emergency Management City
EMAC	Emergency Management Assistance Compact
EMMA	Emergency Management Mutual Aid
EMPG	Emergency Management Performance Grant
EMPT	Emergency Management Planning Team
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	United States Environmental Protection Agency
ERP	Emergency Response Plan
EVC	Emergency Volunteer Center
ERT	Emergency Response Team
EXPLAN	Exercise Plan



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**SECTION SEVEN**

F	
FBI	Federal Bureau of Investigation
FE	Functional Exercise
FEMA	Federal Emergency Management City
FERC	Federal Energy Regulatory Commission
FIRESCOPE	Firefighting Resources of California Organized for Potential Emergencies
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
FMAG	Fire Mutual Aid Grant
FOG	Field Operations Guide
FOUO	For Official Use Only
FPC	Final Planning Conference
FPPC	Fair Political Practices Commission
G	
G&T	Preparedness Directorate's Office of Grants and Training
GIS	Graphical Information System
GPS	Global Positioning System
H	
HMAG	Hazard Mitigation Assistance Grant
HazMat	Hazardous Materials
HMGP	Hazard Mitigation Grant Program
Hotwash	Debriefing of Personnel Immediately after an Exercise
HSC	Homeland Security Council
HSEEP	Homeland Security Exercise and Evaluation Program
HSPD	Homeland Security Presidential Directive
HSPD-5	Homeland Security Presidential Directive-5
I	
IAEM	International Association of Emergency Managers
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IDE	Initial Damage Estimate
ICP	Incident Command Post
IMAT	Incident Management Assistance Team
IPC	Initial Planning Conference
IS	Independent Study (FEMA Course)



**DRAFT CITY OF SOUTH PASADENA DRAFT  
LOCAL HAZARD MITIGATION PLAN**

**SECTION SEVEN**

<b>J</b>	
JIC	Joint Information Center
JIS	Joint Information System
JOC	Joint Operations Center
<b>K</b>	
<b>L</b>	
LDRM	Local Disaster Recovery Manager
LEPC	Local Emergency Planning Committee
LHMP	Local Hazard Mitigation Plan
LNO	Liaison Officer
LOTO	Lock-out/Tag-out
<b>M</b>	
MA	Mutual Aid
MAC	Multi City Coordination
MACS	Multi-City Coordination System
MCI	Mass Casualty Incident
MH	Medical Health
MHOAC	Medical Health Operational Area Coordinator
MMI	Modified Mercalli Index
MOU	Memorandum of Understanding
MSEL	Master Scenario Events List
M <sub>w</sub>	Moment Magnitude
<b>N</b>	
NDRF	National Disaster Recovery Framework
NFIP	National Flood Insurance Program
NIC	National Incident Management System (NIMS) Integration Center
NIMS	National Incident Management System
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NPREP	National Preparedness for Response Exercise Program
NPS	National Preparedness System
NRF	National Response Framework
NWS	National Weather Service





**DRAFT CITY OF SOUTH PASADENA DRAFT  
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**SECTION SEVEN**

<b>O</b>	
OA	Operational Area
OES	Office of Emergency Services
OSHA	Occupational Health and Safety Administration
<b>P</b>	
PM2.5	Particulate Matter (2.5 microns or smaller)
PDM	Pre-Disaster Mitigation
PDRP	Post-Disaster Recovery Plan
PGA	Peak Ground Acceleration
PHA	Peak Horizontal Acceleration
PIO	Public Information Officer
PMF	Probable Maximum Flood
POC	Point of Contact
PPD	Presidential Policy Directive
PPE	Personal Protective Equipment
<b>Q</b>	
QPF	Quantitative Predictive Forecast
R&D	Research and Development
REOC	Regional Emergency Operations Center
RESTAT	Resources Status
RFC	Repetitive Flood Claim
RSF	Recovery Support Function
RSP	Render-Safe Procedures
<b>S</b>	
SCADA	Supervisory Control And Data Acquisition
SCE	Southern California Edison
SEMS	Standardized Emergency Management System
SFHA	Special Flood Hazard Area
SITREP	Situation Report
SMART	Simple, Measurable, Achievable, Realistic, Task-oriented
SME	Subject Matter Expert
SOC	State Operations Center
SOP	Standard Operating Procedure
SRL	Severe Repetitive Loss
SWRCB	State Water Resources Control Board



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**SECTION SEVEN**

<b>T</b>	
TA	Homeland Security Preparedness Technical Assistance Program
T&EPW	Training and Exercise Plan Workshop
TAG	Threat Assessment Group
TCL	Target Capabilities List
Tech Spec	Technical Specialist
TFL	Task Force Leader
THIRA	Threat and Hazard Identification and Risk Assessment
TTX	Tabletop Exercise
<b>U</b>	
UC	Unified Command
UAC	Unified Area Command
USACE	United States Army Corps of Engineers
USAR	Urban Search and Rescue
USBR	United States Bureau of Reclamation
USFS	United States Forest Service (Dept. of Agriculture)
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTL	Universal Task List
UW	United Way
<b>V</b>	
VIP	Very Important Person
VOAD	Volunteer Organizations Active in Disasters
<b>W</b>	
WHO	World Health Organization
WUI	Wildland-Urban Interface
<b>X</b>	
<b>Y</b>	
<b>Z</b>	