2025 WATER SHORTAGE CONTINGENCY PLAN

CITY OF POMONA

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AF	Acre-Foot
AFY	Acre-Feet per Year
CII	Commercial, Industrial, and Institutional
City	City of Pomona
CWC	California Water Code
DMM	Demand Management Measure
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
IEUA	Inland Empire Utilities Agency
LACSD	Los Angeles County Sanitation Districts
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

The City of Pomona's (City) Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- The City's WSCP is a detailed approach which presents how the City intends to act, or respond, in the case of an actual water shortage contingency.
- Preparation of the City's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Beginning July 1, 2022, the City has submitted the Annual Assessment every year through 2025. The Annual Assessment includes a review of the City's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent the City's water demands prior to any "response actions" the City may invoke pursuant to the City's WSCP.
- The City will manage water supplies to minimize the adverse impacts of water shortages. The City's plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels including up to 10, 20, 30, 40, and 50 percent shortages, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.

- For each declared water supply shortage level, the City has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.
- The operational changes the City will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- The City's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of the City's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the City's water service area are provided.
- The effectiveness of the shortage response actions for each of the City's standard water shortage levels is presented. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by the City when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with City's standard water shortage levels are presented.
- The legal authorities associated with City's standard water shortage levels are presented.
- The financial consequences associated with City's standard water shortage levels are presented.
- The City will evaluate the need for revising the WSCP in order to resolve any water shortage gaps, as necessary. The steps necessary for the City to adopt and amend its WSCP are presented.

The following WSCP includes references to Chapters and Sections from the City's 2025 Urban Water Management Plan (UWMP):

1 WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

The City's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Six Basins, groundwater from Chino Basin, groundwater from Spadra Basin, treated surface water from San Antonio Creek, treated imported water purchased from Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD), and recycled water purchased from the Los Angeles County Sanitation Districts (LACSD). The City provides recycled water for irrigation in lieu of potable water supplies. Both Six Basins and Chino Basin are adjudicated, and groundwater supplies are managed. The reliability of the various sources of supply is discussed in Chapter 5 of the 2025 UWMP. Based on the adjudication provisions in the two groundwater basins, the City is able to produce groundwater without limitation, provided an applicable assessment is paid to the respective Watermaster service to purchase untreated imported water for groundwater replenishment. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage. Finally, recycled water is locally generated and is not impacted by drought conditions.

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Beginning July 1, 2022, the City has submitted an Annual Assessment in accordance with Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a review of the City's unconstrained water demands (i.e. water demands prior to any projected response actions the City may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. The City also includes information regarding anticipated shortages, triggered shortage response actions,

compliance and enforcement actions, and communication actions consistent with the City's WSCP.

For each Annual Assessment, the City prepares a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

The City produces groundwater from the Chino Basin, Spadra Basin, and Six Basins as its primary sources of water supply and these basins are managed on a fiscal year (FY) basis. Consequently, during the third quarter of each fiscal year, the City reviews its water demands from the initial six months along with the current groundwater basin conditions and local hydrology. This information is used to help develop the Annual Assessment. The City compares total demand to total supply to identify potential shortages. If shortages are identified, the City will determine the necessary WSCP level and corresponding reduction. A draft of the Annual Assessment is circulated internally within the City for peer review and comment. Based on comments received, a redraft is prepared and provided to City managers during the Spring of each year. The draft is subsequently provided to the City Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to the City Council for review and included in the agenda as part of a City Council meeting such that it can be approved, and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessment is instrumental in providing guidance to the City for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency

and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supply resources are available to the City.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies that are evaluated by the City during the preparation of the preliminary assessment will include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment are identified. The evaluation criteria includes, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability.

2) Water Supply: A description of each available water supply source is provided. The descriptions includes a quantification of each available water supply source and are based on review of current production capacities, historical production, UWMPs, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, are reviewed. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section 8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified for each source of supply. The evaluation includes factors such as estimated water demands, weather,

groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), will be considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

3 SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.
(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross reference relating its existing categories to the six standard water shortage levels.

The City will manage water supplies to prudently minimize the adverse impacts of water shortages. The City's plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels corresponding to progressive ranges from up to a 10, 20, 30, 40, and 50 percent shortages, and greater than a 50 percent shortage.

For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level. The required percentage reduction for each customer will be based on water usage during the same billing period in the last calendar year during which there were no declared water shortages.

The City's Ordinance No. 4122 ("Water Conservation and Water Supply Shortage Program and Regulations"), adopted in June 2009, previously established three (3) water shortage levels. A copy of Ordinance No. 4122 is provided in Appendix A. In accordance with the CWC in which urban water suppliers are required to define six standard water shortage levels, the City has developed the crosswalk illustrated below that translates the City's previously established shortage levels to the mandated standard shortage levels. The shortage level changes were made in 2020 and have remained the same for 2025.

Corresponding Relationships Between Supplier's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels

Established Level	Supply Condition/ Shortage
1	10%
2	11 to 30%
3	> 30%

2020 Standard Level	Shortage Level
1	≤10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	40 to 50%
6	> 50%

Note: The 2020 shortage levels have remained the same for 2025.

Table 1 provides a description of the six standard water shortage levels which may be triggered by a shortage in one or more of the City's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** (*Narrative description*)
1	Up to 10%	Watering or irrigating is limited to a maximum of 3 days per week during April through October and a maximum of 1 day per week during November through March. All leaks, breaks, or other malfunctions must be repaired within 72 hours. In addition, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.
2	Up to 20%	In addition to Shortage Level 1, actions include increased limitation on watering or irrigating; all leaks, breaks, or other malfunctions must be repaired within 48 hours; Limits on filling ornamental lakes, washing vehicles, and filling residential swimming pools and spas.
3	Up to 30%	In addition to Shortage Level 2, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.
4	Up to 40%	In addition to Shortage Level 3, actions include restrictions on watering or irrigating and all leaks, breaks, or other malfunctions must be repaired within 24 hours. The City in its sole discretion may decide not to provide new potable water service or may discontinue service.
5	Up to 50%	In addition to Shortage Level 4, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.
6	>50%	In addition to Shortage Level 5, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.

Notes

4 SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

Shortage response actions are dependent on the severity of a declared shortage level. Response actions implement varying improvements and regulations of system infrastructure and operations, water supply augmentation, demand reduction initiatives and other water use functions to conserve water supplies.

4.1 DEMAND REDUCTION

The City has established water shortage response actions to reduce demand on water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions. Depending on the percent reduction in the City's water supply and corresponding water shortage level, regulations have been made to conserve water and reduce the shortage gap in normal supply levels. Many demand reduction actions are applicable to all levels of water shortages while others are exclusive to certain levels of shortage. The structure of demand reduction actions under a specific water shortage level are designed to encourage those customers with high gallon per capita usage to achieve proportionally greater reduction than those with low use. Violations of these demand reduction actions may be considered waste and an unreasonable use of water. Table 2 describes each demand reduction action and its effect on reducing the shortage gap.

The following demand reduction actions are applicable to all water shortage levels and are in effect at all times:

- Watering or irrigating of any lawn, landscape, or other vegetated area in a manner that causes or allows excessive water runoff onto an adjoining sidewalk, driveway, street, alley gutter, or ditch is prohibited.
- Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device, that is not continuously attended, is limited to no more than 15 minutes watering per day per station. This does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour and weather-based controllers or stream rotor sprinklers that meet a 70 percent efficiency standard. Operating a water fountain or other decorative water feature that does not use recirculated water is prohibited.
- Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, or a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.
- Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat, motor home, or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or at a commercial car washing facility that utilizes a recirculating water system. Installation of non-recirculating water systems is prohibited in new commercial conveyor car wash, new commercial laundry systems, or new other water intensive operations as determined by the City.
- Commercial lodging establishments must provide customers with an optional daily towel and linen laundering service. Commercial lodging establishments must prominently display notice of this option in each bathroom. Contingent on available

funding and materials as determined by the City in its sole discretion, the City will annually provide display materials to establishments for notice on these items.

- Food preparation establishments are prohibited from using non-water conserving dish wash spray valves.
- Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, club, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

Water Supply Shortage Level 1:

- Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water during the months of April through October is limited to three days per week on a schedule established by the City. (By way of example - Odd addresses on Monday, Wednesday, and Friday; even addresses on Tuesday, Thursday, and Saturday.) During the months of November through March, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to no more than one day per week on a schedule established and noticed by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday.) This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the City unless other arrangements are made with the City.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable

notice to customers. This includes an increase in the conservation rate structure and increased performance of water loss audits.

Water Supply Shortage Level 2:

In addition to the restrictions identified in Water Supply Shortage Level 1, the following additional water conservation requirements apply:

- Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water during the months of April through October is limited to two days per week on a schedule established by the City. (By way of example - Odd addresses on Monday and Thursday, even addresses on Tuesday and Friday). During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday). This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.
- Limits on Filling Ornamental Lakes or Ponds: Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a standard Water Shortage Level 2.
- Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat, motor home, or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket

or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.

- Limits on Filling Residential Swimming Pools and Spas: Refilling of more than one foot per week, and initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased performance of water loss audits.

Water Supply Shortage Level 3:

In addition to the restrictions identified in Water Supply Shortage Level 2, the following additional water conservation requirements apply:

- Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water during the months of April through October is limited to two days per week on a schedule established by the City. (By way of example - Odd addresses on Monday and Thursday, even addresses on Tuesday and Friday). During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday). This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.
- Limits on Filling Ornamental Lakes or Ponds: Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a standard Water Shortage Level 3.
- Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat, motor home, or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.
- Limits on Filling Residential Swimming Pools and Spas: Refilling of more than one foot per week, and initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions, or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased performance of water loss audits.

Water Supply Shortage Level 4:

In addition to the restrictions identified in Water Supply Shortage Level 3, the following additional water conservation requirements apply:

- No Watering or Irrigating: Watering or irrigating of lawn, landscape, or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

a) Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering hour restrictions;
b) Maintenance of existing landscape necessary for fire protection;
c) Maintenance of existing landscape for soil erosion control;
d) Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;
e) Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two days per week according to the established watering schedule and time restrictions;

- Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within 24 hours of notification by the City unless other arrangements are made with the City.
- New Potable Water Service: The City, dependent on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:

a) A valid, unexpired building permit has been issued for the project; or
b) The project is necessary to protect the public's health, safety, and welfare; or
c) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less, or as determined by the City Manager or designee.

- Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this WSCP.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased water loss audits.

Water Supply Shortage Level 5:

In addition to the restrictions identified in Water Supply Shortage Level 4, the City may implement further and more restrictive water conservation measures under Water Supply Shortage Level 5. The following additional water conservation requirements apply:

- No Watering or Irrigating: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:
    a) Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering hour restrictions;
    b) Maintenance of existing landscape necessary for fire protection;
    c) Maintenance of existing landscape for soil erosion control;
    d) Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;
    e) Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two days per week according to the established watering schedule and time restrictions;

- Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within 24 hours of notification by the City unless other arrangements are made with the City.

- New Potable Water Service: The City, dependent on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:
    a) A valid, unexpired building permit has been issued for the project; or
    b) The project is necessary to protect the public's health, safety, and welfare; or
    c) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

  This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less, or as determined by the City Manager or designee.
- Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this WSCP.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased water loss audits.

<u>Water Supply Shortage Level 6:</u>

In addition to the restrictions identified in Water Supply Shortage Level 5, the City may implement further and more restrictive water conservation measures under Water Supply Shortage Level 6. The following additional water conservation requirements apply:

- No Watering or Irrigating: Watering or irrigating of lawn, landscape, or other vegetated area with potable water is prohibited. This restriction does not apply to

the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

a) Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering hour restrictions;
b) Maintenance of existing landscape necessary for fire protection;
c) Maintenance of existing landscape for soil erosion control;
d) Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;
e) Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two days per week according to the established watering schedule and time restrictions;

- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within 24 hours of notification by the City unless other arrangements are made with the City.

- New Potable Water Service: The City, dependent on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:

a) A valid, unexpired building permit has been issued for the project; or
b) The project is necessary to protect the public's health, safety, and welfare; or
c) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less, or as determined by the City Manager or designee.

- Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this WSCP.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased water loss audits.

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	No excessive runoff.	Yes
1	Landscape - Prohibit certain types of landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	No watering/irrigating for more than 15 min/day/station.	Yes
1	CII - Lodging establishment must offer opt out of linen service	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY		Yes
1	CII - Commercial kitchens required to use pre-rinse spray valves	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY		Yes
1	Water Features - Restrict water use for decorative water features, such as fountains	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Water features must operate with recirculated water.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Exceptions for hand-held bucket or similar container or a hand- held hose equipped with a positive self-closing water shut-off nozzle or device	Yes
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Exceptions for hand-held bucket or similar container or a hand- held hose equipped with a positive self-closing water shut-off nozzle or device	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Must be repaired within 72 hours of notification.	Yes
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Maximum 3 days a week.	Yes
1	Increase Frequency of Meter Reading	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Per evaluation of annual water loss audits.	No
1	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	At the sole discretion of City Council.	Yes
2	Other	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 3,627 AFY	All actions under Shortage Level 1	Yes
2	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Maximum 2 days a week.	Yes
2	Other water feature or swimming pool restriction	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Filling ornamental, lakes, ponds, pools, or spas is prohibited.	Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Must be repaired within 48 hours of notification.	Yes
3	Other	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 5,441 AFY	All actions under Shortage Level 2	Yes
4	Other	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 7,254 AFY	All actions under Shortage Level 3	Yes
4	Moratorium or Net Zero Demand Increase on New Connections	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY	The City may decide not to provide new service or discontinue water service.	Yes
4	Landscape - Prohibit all landscape irrigation	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY		Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY	Must be repaired within 24 hours of notification.	Yes
5	Other	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 9,068 AFY	All actions under Shortage Level 4	Yes
6	Other	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 9,068 AFY	All actions under Shortage Level 5	Yes

Notes:

4.2 SUPPLY AUGMENTATION

The City does not plan to add a new source of water supply to address customer demands but instead will consider increased supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, the City will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 4 of the UWMP, the City's sources of water supply include groundwater produced from the Chino Basin, Spadra Basin, and Six Basins, treated imported water purchased from MWD through TVMWD, and recycled water supplies provided by LACSD. As noted in Section 2, beginning July 1, 2022, the City has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. In the event the City is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, the City will consider the water supply (augmentation) actions described below.

For each water shortage level discussed in Section 3, the City will consider supplementing its existing treated imported water supplies through increased production of groundwater supplies, to the extent possible. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies,

including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its Municipal and Industrial (M&I) retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full Service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any Full Service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's primary response to any gap between core supplies (from the State Water Project (SWP) and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million AF. Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, the City will use up to the treated imported water supply made available from MWD through TVMWD in association with each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measures through the various stages of action.

The City has the flexibility to augment its existing water supplies through production of groundwater from the Six Basins and Chino Basin. The Six Basins is managed by the Six Basins Watermaster, and the Chino Basin is managed by the Chino Basin Watermaster. During the periods of management under the Six Basin Judgment and the Chino Basin

Judgment, significant drought events have occurred. In each drought cycle, both the Six Basins and the Chino Basin have been managed to maintain water levels. Parties to the Six Basins Basin Judgment and Chino Basin Judgment, including the City, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the respective Watermaster. The assessments are used to purchase untreated imported water to replenish the Six Basins and Chino Basin. The Six Basins Watermaster purchases untreated imported water to replenish the Six Basins from MWD through TVMWD. The Chino Basin Watermaster purchases untreated imported water to replenish the Chino Basin from MWD through Inland Empire Utilities Agency (IEUA). In addition, groundwater quality in the Six Basins and the Chino Basin is not expected to impact potable supplies or constrain supply reliability. Groundwater quality is carefully monitored and managed by the Watermaster for each respective basin. In addition, Treatment facilities and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Based on historical and on-going management practices, the City will be able to continue relying on the Six Basins and Chino Basin for adequate supplies in response to each of the standard water shortage levels identified in Section 3. An additional potential source of replenishment water is recycled water.

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Transfers	Not applicable (see Notes)	
2	Transfers	Not applicable (see Notes)	
3	Transfers	Not applicable (see Notes)	
4	Transfers	Not applicable (see Notes)	
5	Transfers	Not applicable (see Notes)	
6	Transfers	Not applicable (see Notes)	

NOTES: The City will consider increased production from Six Basins and the Chino Basin using existing facilities to address increased demands. As noted on Table 2, the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, the City will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 4.2 describes the City's water supply sources and water supply augmentation actions available. Section 4.2 describes the City's standard water shortage levels and associated demand reduction measures. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow the City to utilize all available water supply sources in response to water shortage situations.

As noted in Section 2, beginning July 1, 2022, the City has prepared and submitted an Annual Assessment which includes a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment assists the City in determining any potential operational changes. In addition, the City's standard water shortage levels and the associated demand reduction measures, in conjunction with the City's existing Demand Management Measures (DMM) (discussed in Chapter 8 of the UWMP), will be essential to the City in reducing water demands during any water shortage period. The operational changes the City will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- Optimized production from existing available water supply sources.
- Potential use of emergency supply sources, including emergency interconnections.
- Potential blending of water supply resources.
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by the City to reduce customer demands are discussed in Section 4.2. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in the City's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.1). In addition to the water supply augmentation actions (Section 4.2) and potential operational changes (Section 4.3) which the City may consider in order to continue providing sufficient water supplies, the City will review and implement any necessary steps included in its ERP.

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including the City, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), confirming the current RRA and ERP have been reviewed and updated. For the City, the RRA certification was due by March 31, 2025, and the ERP certification was due by September 30, 2025.

The City's RRA evaluates the vulnerabilities, threats, and consequences from potential hazards to the City's water system. The City prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and

- Operation and maintenance.

The City's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with the City's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

The City's ERP provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances. The City's ERP (which is incorporated by reference) provides guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as chlorine release, and earthquake, or a threat of contamination). The ERP also incorporates the results of the City's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity;
- Plans and procedures for responding to a natural hazard or malevolent act;
- Actions and equipment to lessen the impact of a natural hazard or malevolent act; and
- Strategies to detect natural hazards or malevolent act.

The City will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. The City will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

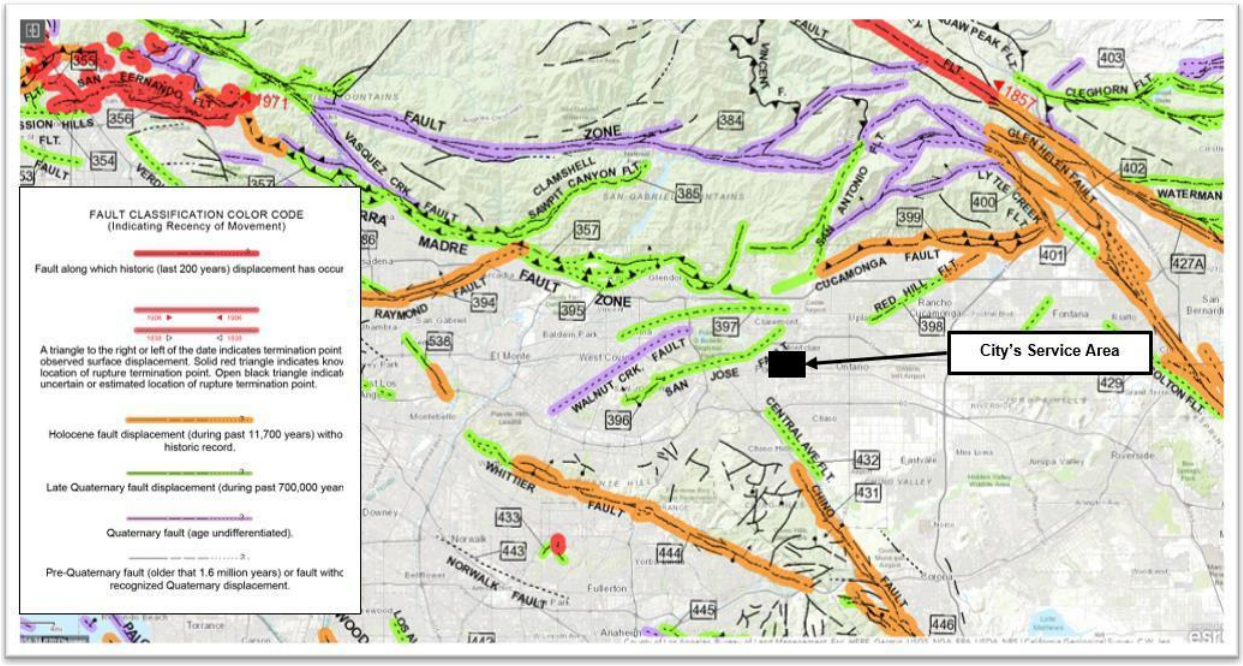
The City prepared a local "Natural Hazards Mitigation Plan Update" which was approved by the Federal Emergency Management Agency (FEMA) in 2022. The "Natural Hazards Mitigation Plan Update" identifies effective ways to assess the significant natural hazards (including earthquakes) that may affect the City and its residents. The "Natural Hazards Mitigation Plan Update" provides resources, information, and strategies to reduce the City's vulnerability to these hazards, while providing guidance for the coordination of mitigation activities throughout the City. The "Natural Hazards Mitigation Plan Update" includes mitigation projects necessary to reduce seismic risk to the City's water distribution system facilities (including its distribution system pipelines, groundwater wells, booster pumps, and storage reservoirs) and potential disruptions in providing water service. The City's "Natural Hazards Mitigation Plan Update" is provided in Appendix B.

The County of Los Angeles prepared an "All-Hazards Mitigation Plan" in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's All-Hazards Mitigation Plan is provided in Appendix C.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater

than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the City's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the City's water service area include the San Andreas fault, the Whittier fault, the San Jose fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

Location of Earthquake Faults

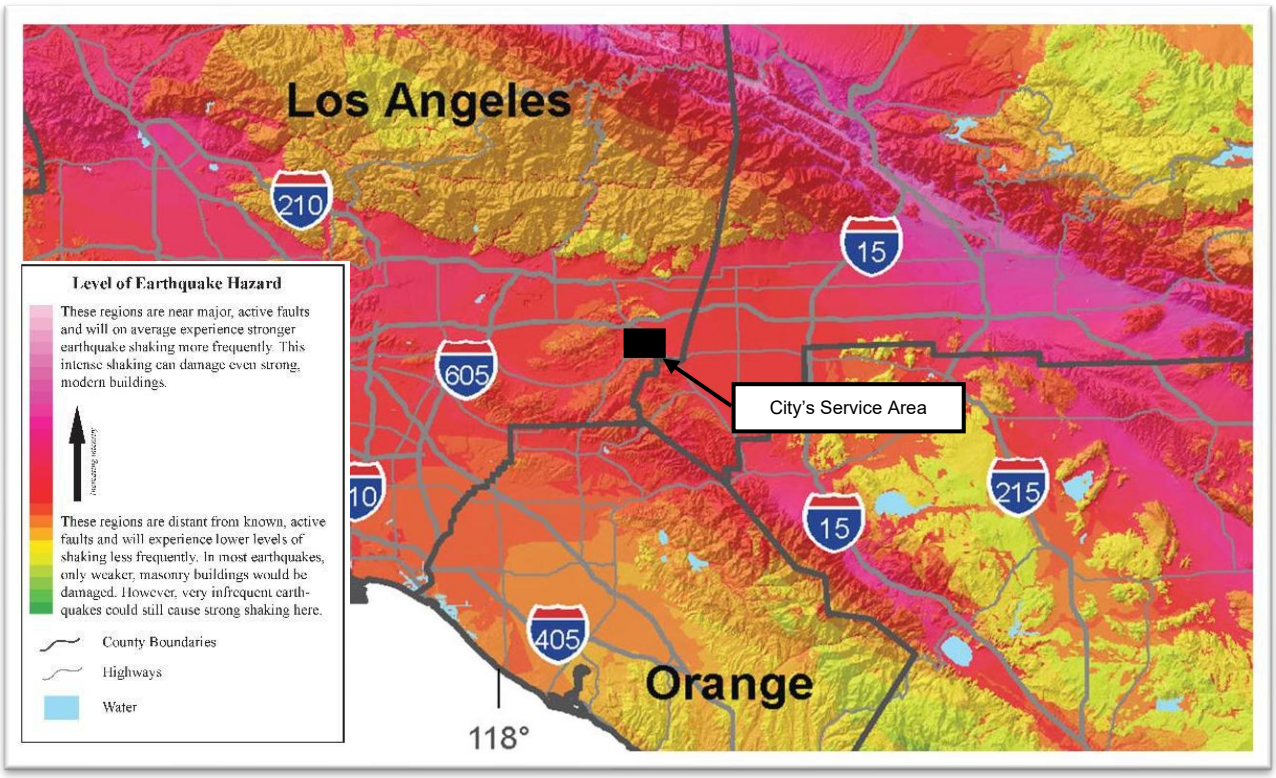


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the City's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including the City's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, the City has prepared an ERP which provides the management, procedures, and designated actions the City and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers

receive a reliable and adequate supply of potable water. The City's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in the City's historical ability to meet its customer's water demands in response to a water supply shortage. In addition, the City imposes water consumption regulations and restrictions and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past five years, the City experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the

City's annual water production averaged 21,505 acre-feet per year (AFY). During the past five years, the average annual production was approximately 19,881 AFY, with a maximum of up to 22,029 AF during FY 2021. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

The City's water demands during the most recent five years averaged approximately 17,168 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), the City's recent water demands have been less than its historical water demands, including during long-term droughts. The City's projected water demands (during a normal year, a single dry year, and a five consecutive year drought conditions) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated the City will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.2, based on historical and on-going management practices, the City will be able to continue relying on its water supply sources from the Chino Basin, Spadra Basin, and Six Basins for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3.

The City previously adopted Resolution No. 2015-41 in May 2015 which declared a water supply shortage and established water-use restrictions and regulations equivalent to the standard water shortage level 2 identified in Section 3. During this Level 2 water shortage period, the City was able to reduce water demands by up to 20 percent and provide sufficient water supplies to its customers. Subsequently, the City adopted Resolution No. 2016-105 in July 2016 which rescinded the Level 2 water supply shortage and declared a water supply shortage equivalent to standard water shortage Level 1. During this Level 1 water shortage period, the City was able to reduce water demand by up to 10 percent and

provide sufficient water supplies to its customers. Copies of the resolutions are provided in Appendix A.

Based on the City's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies through long-term droughts, it is anticipated that the City will be able to provide sufficient water supplies to its customers during each of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. The City will enact varying levels of its WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 2 and Table 3. The effectiveness of the City's shortage response actions are based on the City's water demands prior to 2015 (unconstrained demands). The City reduced its water demands in 2015 in response to the Governor's April 1, 2015, Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. The City's actual water demand reduction during this period was used to estimate the extent of water use reductions for the City's Water Shortage Stages. The City's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5 COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

The City utilizes established communication protocols and procedures to inform customers, the general public, interested parties, and local agencies of current or anticipated water shortages, shortage response actions, and other relevant information.

Beginning July 1, 2022, the City has submitted an Annual Assessment in accordance with DWR's guidance and requirements. The Annual Assessment includes a review of the City's unconstrained water demands (i.e. water demands prior to any projected response actions the City may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. The City will also include information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the City's WSCP. See Section 2 for more information regarding the Annual Assessment.

Standard water shortage levels may be declared by resolution of the City Council, adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation requirements applicable to the shortage level conditions will take effect on the 10th day after the date the shortage level is declared. Within seven days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it must provide notice of the allocation by including it in the regular billing statement. A water allocation will be effective on the 5th day following the date of mailing or at such later date as specified in the notice. The City may declare an end to any water shortage level upon recommendation by the City Manager, or designee, and resolution by the City Council at any regular or special meeting of the City Council.

Under unique circumstances where a specific requirement of this WSCP would result in undue hardship to a customer that is disproportionate to the impacts on other customers, the customer may apply for a waiver pursuant to the requirements as provided in this WSCP. The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to the customer. The customer must provide the following documents for review:

(1) The application for a waiver prescribed by the City and accompanied by a non-refundable processing fee in an amount set by City Council resolution.

(2) Photographs, maps, drawings, and other information, including a written statement of the applicant.

An application for a waiver will be denied unless the City finds, based on the information provided in the application, supporting documents, or such additional information that may be requested, and on water use information for the property as shown by the records of the City or its agent, all of the following:

(1) That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other customers;

(2) That, because of special circumstances applicable to the property or its use, the strict application of this division would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

(3) That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this division and will not be detrimental to the public interest; and

(4) That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent, or general in nature.

The City Manager or designee must act upon any completed application no later than ten business days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the City Manager, or designee, shall be final.

6 COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

Any violation of this WSCP is considered a waste and an unreasonable use of water. The City will track violations by analyzing the City water loss audits for potential leak locations and by documenting correspondence of the City Water Watcher Reporting Line, a 24- Hour Service where customers can report witnessing the abuse of water supplies.

Any violation of this WSCP may be prosecuted as a misdemeanor or as an infraction, at the discretion of the City, pursuant to Article X of the Pomona Municipal Code (Code). Pursuant to Section 1-7 of this Code, a misdemeanor is punishable by imprisonment in the county jail for no more than 30 days, or by a fine not exceeding $1,000.00, or by both.

The City Manager and respective departments shall have the authority to administer and enforce this division.

Pursuant to this WSCP, penalties for failure to comply with any provisions of the WSCP are as follows:

(1) A fine not exceeding $100.00 for a first violation.

(2) A fine not exceeding $200.00 for a second violation of the same provision within one year.

(3) A fine not exceeding $500.00 for each additional violation of the same provision within one year.

a. *Water flow restrictor:* In addition to any fines, the City may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of 48 hours.

b. *Termination of service:* In addition to any fines and the installation of a water flow restrictor, the City may disconnect and/or terminate a customer's water service.

A person or entity that violates this division is responsible for payment of the City's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the City's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the City before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

Pursuant to this WSCP, each day that a violation of this ordinance occurs is a separate offense.

The City will issue a notice of violation by mail or personal delivery at least ten days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the violation by filing a written notice of appeal pursuant to this WSCP.

Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water shortage level condition.

7 LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

The City is responsible for implementing and enforcing the water shortage response actions described in Section 4. This WSCP is subject to any changes deemed necessary by the City.

The City Manager, or designee, may declare a water shortage emergency and may immediately enact the mandatory requirements of any of the levels designated herein. The required measures of the designated water shortage level will be effective immediately and will be communicated to the public. The emergency implementation will be ratified by resolution of the City Council at its next meeting.

The City shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency. This includes the Cities of Chino Hills, Claremont, La Verne, and Montclair, and the County of Los Angeles.

The City shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

8 FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

The City's primary source of revenue is user service charges, which consists of bimonthly fixed readiness-to-serve charges according to meter size and a volumetric charge per unit of water consumed. The bimonthly fixed readiness-to-serve charges are sufficient to meet about 45 percent of the City's operations and maintenance expenses. The revenue from the consumption charge is designed to be sufficient to fund the remaining 55 percent of the operations and maintenance expenses plus all of the variable expenses associated with the cost of water. The current water rates are provided in Appendix D.

The City Council may adopt resolutions to make additional adjustments to the water rates based on the City's increased costs to provide water for its customers.

The City has historically maintained a financial reserve in its Water Fund. The City may use financial reserves for water system expenditures to make up for shortfalls in water revenue associated with unanticipated reduced water sales.

9 MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

Customer compliance with the provisions adopted by declaration of a WSCP are monitored and reported through water loss audits performed by the City's Water Resource Department. Staff prepare annual Distribution System Water Audits to monitor water

losses. Staff review the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. The City regularly monitors its system and repairs leaks in a timely manner. To help in its effort to reduce and eliminate losses, the City has purchased various sound correlators for identifying system leaks. In those areas where a leak is visible, staff are dispatched to a site to pinpoint the leak to minimize the excavation area and save resources.

The City's Water Resources Department is also the first point of contact of the City Water Watcher Reporting Line, a 24-Hour Service where customers can report witness of abuse of water supplies. Reports are documented for record of offenses and necessary penalties.

10 WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

The City's WSCP has been prepared as an adaptive management plan. As discussed in Section 9, the City will monitor and report on the implementation of the WSCP. The City will review the implementation results for any current or potential shortage gaps between water supplies and demands. The City will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. The City will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.2).
- Implementation of stricter enforcement actions and penalties (discussed in Section 6).

- Improvements to the water supply augmentation responses (discussed in Section 4.2), as well as any associated operational changes (discussed in Section 4.3) which may be required.
- Incorporation of additional actions recommended by City staff or other interested parties.

The City will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

This WSCP is adopted as part of the City's 2025 UWMP adoption process discussed in Section 9.2 of the UWMP. It is anticipated the City will review, revise, and adopt an updated WSCP as part of preparing its 2031 UWMP, as necessary. However, the City will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to the City's WSCP will include a public hearing and adoption process by City Council (see Section 12).

11 SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

The City's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, the City's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

Please see Section 4.1. for specific demand reduction actions in relation to special water features.

12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

The City's WSCP is adopted as part of the City's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting the City's WSCP includes the following:

- The City will conduct a public hearing and make the WSCP available for public inspection.
- The City will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- The City will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- The City Council will adopt the 2025 UWMP and the WSCP.
- As part of submitting the 2025 UWMP to DWR, the City will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. The City will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, the City will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

The City will conduct a public hearing and make the amended WSCP available for public inspection.

- The City Council will adopt the amended WSCP.
- The City will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Within 30 days after submission of the WSCP to DWR, the City will provide the WSCP to any city or county within which the City provides water.

Additional information regarding the adoption, submittal, and availability of the City's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

CITY OF POMONA ORDINANCE AND RESOLUTIONS

ORDINANCE NO. 4122

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF POMONA AMENDING CHAPTER 62 ("UTILITIES") OF THE POMONA CITY CODE TO ESTABLISH A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM AND REGULATIONS

WHEREAS, from time to time, drought conditions in the State of California have resulted in reduced water supply to the Pomona Valley;

WHEREAS, the water supply from outside sources such as the Bay-Delta Region, the Eastern Sierras, and the Colorado River has become uncertain and unreliable;

WHEREAS, on February 27, 2009, Governor Arnold Schwarzenegger proclaimed a statewide emergency due to the drought resulting from a combination of worsening water supply conditions;

WHEREAS, a reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the City of Pomona (the "City");

WHEREAS, careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs;

WHEREAS, currently Chapter 62, Article IV, Division 4 of the Pomona City Code details a water conservation program;

WHEREAS, in order to meet the water needs of City residents and businesses, and the needs of customers of the City's water utility, and to protect the public from the potential health hazards posed by a drought, the City must impose a stricter, more comprehensive water conservation program; and

WHEREAS, pursuant to California Water Code Section 375 *et seq.*, the City Council desires to adopt and enforce the following water conservation program to reduce water consumption and conserve supplies, and to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Pomona as follows:

SECTION 1. That Division of Article IV of Chapter 62 of the Pomona City Code is hereby repealed and replaced with the following:

Division 4. "Water Conservation and Water Supply Shortage Program."

Section 62-351. Title

This division shall be known as the City of Pomona Water Conservation and Water Supply Shortage Program.

Section 62-352. Definitions

The following words and phrases whenever used in this division shall have the meaning defined in this section:

(1) "City" means the City of Pomona.

(2) "Person" means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the City.

(3) "Landscape Irrigation System" means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand, or through an automated system.

(4) "Large Landscape Areas" means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.

(5) "Single Pass Cooling Systems" means equipment where water is circulated only once to cool equipment before being disposed.

(6) "Potable Water" means water which is suitable for drinking.

(7) "Recycled Water" means the reclamation and reuse of non-potable water for beneficial use.

(8) "Billing Unit" means the unit of water used to apply water rates for purposes of calculating water charges for a person's water usage and equals one hundred (100) cubic feet or seven hundred forty-eight (748) gallons of water.

Section 62-353. Application

(a) The provisions of this division apply to any person, customer and property served by the City.

(b) The provisions of this division do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire, and other similar emergency services.

(c) The provisions of this division do not apply to the use of recycled water, with the exception of Section 62-354(a).

(d) The provisions of this division do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops, or other vegetation intended for commercial sale.

(e) Where any provision of the Pomona City Code is in conflict with any provision of this division, the provision of this division shall take precedence. This includes, but is

not limited to, Chapter 18, Article V (Landscape Maintenance) of this Code, and Section .600 (Exterior Property Maintenance) of the Pomona Zoning Ordinance.

(f) This division is intended solely to further the conservation of water. It is not intended to implement any provision of federal, state, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff.

Section 62-354. Permanent Water Conservation Requirements

The following water conservation requirements are effective at all times and are permanent. Violations of this section will be considered waste and an unreasonable use of water.

(a) *Limits on Watering Hours.* Watering or irrigating of lawn, landscape or other vegetated area with potable or recycled water is prohibited between the hours of 10 a.m. and 6 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting, or repairing an irrigation system.

(b) *Limit on Watering Duration.* Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device, that is not continuously attended, is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a seventy percent (70%) efficiency standard.

(c) *No Excessive Water Flow or Runoff.* Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited.

(d) *No Washing Down Hard or Paved Surfaces.* Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, or a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

(e) *Obligation to Fix Leaks, Breaks or Malfunctions.* Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven (7) days of receiving notice from the City, is prohibited. The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this subsection.

(f) *Re-circulating Water Required for Water Fountains and Decorative Water Features.* Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited, effective January 1, 2010.

(g) *Limits on Washing Vehicles.* Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat, motor home or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

(h) *Drinking Water Served Upon Request Only.* Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, club or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

(i) *Commercial Lodging Establishments Must Provide Option to Not Launder Linen Daily.* Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language. Contingent on available funding and materials as determined by the City in its sole discretion, the City will annually provide display materials to establishments for notice on these items.

(j) *No Installation of Single Pass Cooling Systems.* Installation of single pass cooling systems is prohibited in buildings requesting new water service.

(k) *No Installation of Non re-circulating water systems in new Commercial Car Wash, new Laundry Systems, or other new water intensive operations as determined by the City.* Installation of non re-circulating water systems is prohibited in new commercial conveyor car wash, new commercial laundry systems, or new other water intensive operations as determined by the City.

(l) *Restaurants Required to Use Water Conserving Dish Wash Spray Valves.* Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

(m) *Commercial Car Wash Systems.* Effective January 1, 2011, all commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the City.

Section 62-355. Level 1 Water Supply Shortage

(a) A Level I water shortage may be declared by the City Manager, or designee, if any combination of events or factors threaten the adequacy of foreseeable water supply to customers. Qualifying factors to be considered in making a water shortage declaration

include, but are not limited to: time of year, local rainfall, Metropolitan Water District's / Three Valleys Municipal Water District's Water Supply Allocation Plans, State Water Project Allocations, Groundwater Conjunctive Use (Dry Year Yield) Program, Operating Safe Yield as determined by the respective Chino Basin or Six Basins Watermasters responsible for groundwater allocation in groundwater basins and any major operating emergencies, or natural disasters that cause damage to the water supply or water distribution system. Prior to making a public announcement of a Level I water shortage, the City Manager, or designee, shall document the basis for the water shortage declaration and communicate this information to the City Council. A Level 1 declaration will require a consumer demand reduction of up to 10% to make more efficient use of water and respond to existing water conditions.

(b) In addition to the prohibited uses of water identified in Section 62-354, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage:

(1) *Limits on Watering Days.* Watering or irrigating of lawn, landscape or other vegetated area with potable water during the months of April through October is limited to three (3) days per week on a schedule established and posted/noticed by the City. (By way of example - Odd addresses on Monday, Wednesday, and Friday; even addresses on Tuesday, Thursday, and Saturday.) During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and noticed by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday.) This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the City unless other arrangements are made with the City.

(3) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

Section 62-356. Level 2 Water Supply Shortage

(a) A Level 2 Water Supply Shortage exists when the City determines, in its sole discretion, that due to such factors as outlined in Section 62-355(a), a water supply shortage exists and a consumer demand reduction of eleven percent (11%) to thirty percent (30%) is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration by the City of a Level 2 Water Supply Shortage

pursuant to Section 62-358(a), the City will implement the mandatory Level 2 conservation measures identified in this section.

(b) In addition to the prohibited uses of water identified in Section 62-354, the following additional water conservation requirements apply during a declared Level 2 Water Supply Shortage:

(1) *Limits on Watering Days.* Watering or irrigating of lawn, landscape or other vegetated area with potable water during the months of April through October is limited to two (2) days per week on a schedule established and posted/noticed by the City. (By way of example - Odd addresses on Monday and Thursday, even addresses on Tuesday and Friday). During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and posted/noticed by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday). This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.

(3) *Limits on Filling Ornamental Lakes or Ponds.* Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this ordinance.

(4) *Limits on Washing Vehicles.* Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus motorcycle, boat, motor home or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

(5) *Limits on Filling Residential Swimming Pools & Spas.* Re-filling of more than one (1) foot per week, and initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.

(6) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

Section 62-357. Level 3 Water Supply Emergency Shortage

(a) A Level 3 Water Supply Emergency Shortage exists when the City declares a water shortage emergency due to such factors as outlined in Section 62-355(a) and notifies its residents and businesses that a significant reduction in consumer demand of more than thirty percent (30%) is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration by the City of a Level 3 Water Supply Emergency Shortage pursuant to Section 62-358(b), the City will implement the mandatory Level 3 conservation measures identified in this section.

(b) In addition to the prohibited uses of water identified in Section 62-354, the following water conservation requirements apply upon the City's declaration of a Level 3 Water Supply Emergency Shortage:

(1) *No Watering or Irrigating.* Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

i. Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two (2) gallons of water per hour subject to the hour restrictions in Section 62-354(a);
ii. Maintenance of existing landscape necessary for fire protection;
iii. Maintenance of existing landscape for soil erosion control;
iv. Maintenance of plant materials identified to be rare or essential to the well being of rare animals;
v. Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section 62-356(b)(1) and time restrictions in Section 62-354(a) and (b)(1);

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the City unless other arrangements are made with the City.

(3) *New Potable Water Service.* Pursuant to Section 356 of the California Water Code, the City, dependant on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:

i. A valid, unexpired building permit has been issued for the project; or
ii. The project is necessary to protect the public's health, safety, and welfare; or
iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one (1) year or less, or as determined by City Manager or designee.

(4) *Discontinue Service.* Pursuant to Section 356 of the California Water Code, the City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.

Section 62-358. Declaration and Notification of Water Supply Shortage

(a) *Declaration and Notification of Levels 1 & 2 Water Supply Shortage.* The existence of Level 1 or Level 2 Water Supply Shortage conditions may be declared by resolution of the City adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Level 1 or Level 2 conditions will take effect on the tenth (10^{th}) day after the date the shortage level is declared. Within seven (7) days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it must provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth (5^{th}) day following the date of mailing or at such later date as specified in the notice.

(b) *Declaration and Notification of Level 3 Water Supply Shortage.* The existence of a Level 3 Water Supply Emergency Shortage may be declared by resolution in accordance with the procedures specified in Sections 351 and 352 of the Water Code. The mandatory conservation requirements applicable to the Level 3 conditions will take effect on the tenth (10^{th}) day after the date the shortage level is declared. Within seven (7) days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for the publication of official notices. If the City establishes a water allocation, it will provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth (5^{th}) day following the date of mailing or at such later date as specified in the notice.

(c) *Declaration and Notification that the Water Supply Shortage Situation Has Ended.* The City of Pomona may declare an end to Water Supply Shortage Levels 1, 2 and 3, as well as any Water Watch voluntary compliance, upon recommendation by the

City Manager, or designee, and resolution by the City Council at any regular or special meeting of the City Council.

Section 62-359. Other Provisions

(a) *Commercial Car Wash Systems.* Effective on January 1, 2011, all commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the City.

(b) *Large Landscape Areas; Rain Sensors.* Large landscape areas, such as parks, cemeteries, golf courses, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, may be required to use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.

(c) *Construction Purposes.* Recycled or non-potable water must be used for construction purposes when available.

(d) *No New Annexations.* Upon the declaration of a Level 3 Water Supply Shortage condition, the City will suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any increased use of water.

(e) *Limits on Building Permits.* Based on the availability of the water supply, the City will administratively limit, or withhold the issuance of building permits, which require new or expanded water service, except to protect the public health, safety and welfare.

(f) *Water Recycling Required if Alternative Available.* The use of potable water, other than recycled water, is prohibited for specified uses after the City has provided to the customer an analysis showing that recycled water is a cost-effective alternative to potable water for such uses and the customer has had a reasonable time, as determined by the City Manager, to make the conversion to recycled water.

(g) *Water Recycling; New Service.* Prior to the connection of any new water service, an evaluation must be done by the City to determine whether recycled water exists to supply all or some of the water needed and recycled water must be utilized to the extent feasible.

(h) *Customer Water Conservation Reports.* The City may, by written request, require all commercial, residential and industrial customers using twenty five thousand (25,000) or more billing units per year to submit a water conservation plan and to submit quarterly progress reports on such plan. The conservation plan must include recommendations for increased water savings, including increased water recycling based on feasibility, and the reports must include progress to date on implementation of such recommendations.

(i) *Water Conserving Plumbing Standards*

(1) Retrofits Upon Sale or Transfer: It is strongly encouraged that structures sold or transferred meet current City and Plumbing codes for water-conserving plumbing fixtures.

(2) Change in Service: Upon the establishment of new water service or a change in water service from one person to another non-family member, the customer will be encouraged to retrofit plumbing fixtures with water-conserving plumbing fixtures.

(j) *Reporting Line.* The City will establish a water waste reporting line for residents to report violations of this division.

(k) *State Model Landscape Ordinance.* The City will utilize the Department of Water Resources State Model Landscaping Ordinance as a reference in the development of future revisions.

(l) *Restrictions and Rates.* The City Council may, in its sole discretion, adopt a resolution to impose additional restrictions or prohibitions on the use of water to achieve reductions, or make additional adjustments to the water rates, based on the City's increased costs to provide water to its customers.

(m) *Voluntary Compliance.* The City Manager, or designee, may recommend, and upon resolution of the City Council, declare a Water Watch condition when there is a reasonable probability that there will be a water supply shortage and that a consumer demand reduction of up to ten (10) percent is required in order to ensure sufficient supplies will be available to meet anticipated demands. Upon such declaration, the City Manager, or designee, shall take action to implement the conservation practices outlined in a Level 1 Water Supply Shortage, on a voluntary basis.

(n) *Emergency Implementation.* Pursuant to Water Code Section 351, should a failure in the water system occur causing an immediate emergency, the City Manager, or designee, may declare a need to immediately enact the mandatory requirements of any of the levels designated herein. The required measures of the designated shortage level will be effective immediately and will be communicated to the public. The emergency implementation will be ratified by resolution of the City Council at its next meeting.

Section 62-360. Hardship Waiver

(a) *Undue and Disproportionate Hardship.* If, due to unique circumstances, a specific requirement of this division would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver pursuant to the requirements as provided in this section.

(b) *Written Finding.* The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

(1) Application: Application for a waiver must be on a form prescribed by the City and accompanied by a non-refundable processing fee in an amount set by City Council resolution.

(2) Supporting Documentation: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

(3) Required Findings for Waiver: An application for a waiver will be denied unless the City finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the City or its Agent, all of the following:

i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

ii. That because of special circumstances applicable to the property or its use, the strict application of this division would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this division and will not be detrimental to the public interest; and

iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

(4) Approval Authority: The City Manager or designee must act upon any completed application no later than ten (10) business days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the City Manager, or designee, shall be final.

Section 62-361. Penalties and Violations

(a) Any violation of this division may be prosecuted as a misdemeanor or as an infraction, at the discretion of the City, pursuant to Article X of this Code. Pursuant to Section 1-7 of this Code, a misdemeanor is punishable by imprisonment in the county jail

for not more than thirty (30) days, or by a fine not exceeding one thousand dollars ($1,000), or by both.

(b) The City Manager and respective departments shall have the authority to administer and enforce this division.

(c) Pursuant to Section 1-7(d) of this Code, penalties for failure to comply with any provisions of the ordinance are as follows:

(1) A fine not exceeding $100.00 for a first violation.

(2) A fine not exceeding $200.00 for a second violation of the same provision within one year.

(3) A fine not exceeding $500.00 for each additional violation of the same provision within one year.

i. Water Flow Restrictor: In addition to any fines, the City may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.

ii. Termination of Service: In addition to any fines and the installation of a water flow restrictor, the City may disconnect and/or terminate a customer's water service.

(d) A person or entity that violates this ordinance is responsible for payment of the City's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the City's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the City before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

(e) Pursuant to Section 1-7(f) of this Code, each day that a violation of this ordinance occurs is a separate offense.

(f) Notice and Hearing:

(1) The City will issue a Notice of Violation by mail or personal delivery at least ten (10) days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal, pursuant to Section 2-1188 et seq. of this Code.

(2) Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Level condition.

SECTION 3. If any section, subsection, sentence, clause or phrase in this division is for any reason held invalid, the validity of the remainder of the division will not be affected. The City Council hereby declares it would have passed this division and each section, subsection,

sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

SECTION 4. The City Clerk shall attest to the adoption of this ordinance, causing it to be posted, and it shall be in full force immediately upon its adoption.

PASSED AND ADOPTED THIS 15th DAY OF JUNE 2009.

ATTEST

for Marie Michel Macias, City Clerk

CITY OF POMONA

Elliott Rothman, Mayor

APPROVED AS TO FORM

Arnold Alvarez-Glasman, City Attorney

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, MARIE MICHEL MACIAS, CITY CLERK of the City of Pomona do hereby certify that the foregoing Ordinance was introduced for first reading on the 1st day of June 2009 and adopted at second reading at a regular meeting of the City Council of the City of Pomona on the 15th day of June, 2009.

AYES: COUNCILMEMBERS: Soto, Rodriguez, Carrizosa, Lantz, Saunders, Atchley, Rothman
NOES: COUNCILMEMBERS: None
ABSENT: COUNCILMEMBERS: None
ABSTAIN: COUNCILMEMBERS: None

for Marie Michel Macias, City Clerk

RESOLUTION NO. 2015-41

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA, CALIFORNIA, DECLARING A LEVEL 2 WATER SUPPLY SHORTAGE AND IMPLEMENTING LEVEL 2 RESTRICTIONS FOR WATER USE REDUCTION TO OUTDOOR URBAN WATER USE

WHEREAS, at the June 15, 2009 City Council meeting, the City Council adopted Ordinance No. 4122 a "Water Conservation and Water Supply Shortage Program" ("Water Conservation Program") that became effective immediately upon adoption pursuant to Water Code Section 376;

WHEREAS, the Water Conservation Program allows the City Council to declare by Resolution a water supply shortage level, and states that the conservation requirements shall take effect on the 10th day after the water shortage level is declared;

WHEREAS, on January 17, 2014, Governor Edmund G. Brown Jr. issued a Drought Emergency Proclamation (January 2014 Proclamation) due to the dire drought conditions and the need to conserve more;

WHEREAS, on February 24, 2014, the City Council adopted a Resolution to request a voluntary water use reduction by all City water customers in response to Governor Brown's Drought Declaration and Metropolitan Water District's (MWD) Statement regarding California's Water Supply Shortage;

WHEREAS, Water Code Section 1058.5 grants the State Water Resources Control Board (SWRCB) the authority to adopt emergency regulations in certain drought years to: "Prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports".

WHEREAS, On July 15, 2014, SWRCB adopted an emergency regulation to support water conservation (Resolution No. 2014-0038) and that regulation became effective July 28, 2014 after approval by the Office of Administrative Law (OAL).

WHEREAS, On March 17, 2015, the SWRCB adopted a Resolution to implement an Expanded Emergency Water Conservation requirement due to the continuing emergency drought conditions (Executive Order B-29-15) to safeguard the State's remaining water supply.

WHEREAS, on May 5, 2015, the SWRCB has adopted a Regulatory Framework to outline the Governor's Executive Order and mandatory actions that need to be taken by water suppliers.

WHEREAS, the City of Pomona is an urban water supplier as defined by Water Code Section 10617;

WHEREAS, as an urban water supplier, the City of Pomona shall comply with California Code of Regulations, Title 23, Sections 863, 864, and 865, under the State Emergency Drought Water Conservation measures, and which requires that the City implement the stage of its water shortage contingency plan that imposes mandatory restrictions on outdoor irrigation;

WHEREAS, the City of Pomona shall comply with California Code of Regulations, Title 23, Sections 351 and 352, by publishing on May 11, 2015, a notice of public hearing in newspaper to allow consumers an opportunity to be heard to protest against the declaration.

WHEREAS, to ensure the City meets the Emergency Water Conservation requirements set forth by the SWRCB in the Regulatory Framework, the City shall reduce their potable water production by 20 percent per the conservation standard based on relative per capita water usage. The conservation standards require the City of Pomona to reduce potable water use of 20 percent.

WHEREAS, a Level 2 Water Supply Shortage, which imposes mandatory restrictions on outdoor irrigation and limits number of days per week that customers can irrigate outdoors, be declared and implemented by the City Council.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. In addition to the Water Conservation Program's permanent water conservation requirements established by Ordinance No. 4122, the City Council hereby declares a Level 2 Water Supply Shortage throughout the City and directs the City Manager to implement the following Level 2 water conservation requirements:

(1) *Limits on Watering Days.* Watering or irrigating of lawn, landscape or other vegetated area with potable water during the months of April through October is limited to two (2) days per week on the following schedule:

- Odd addresses on Monday and Thursday
- Even addresses on Tuesday and Friday

During the months of November through March, watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on the following schedule:

- Odd addresses on Thursday
- Even addresses on Tuesday

This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when an emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 48 hours of notification by the City unless other arrangements are made with the City.

(3) *Limits on Filling Lakes or Ponds*: Filing or refilling ornamental lakes or ponds are prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this division.

(4) *Limits on Washing Vehicles*: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat, motor home or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.

(5) Limits on Filling Residential Swimming Pools and Spas. For existing pools and outdoor spas, re-filling with potable water is limited to no more than one (1) foot per week. Initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.

(6) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

SECTION 2. The City of Pomona shall comply with the Governor's Executive Order B-29-15 signed on April 1, 2015, and implement the State Water Resources Control Board Resolution adopted on May 5, 2015 to reduce potable water usage by 20 percent by February 2016.

SECTION 3. In accordance with "Division 4 – Water Conservation and Water Supply Shortage Plan" of the Pomona City Code, the City Council hereby directs the City Clerk to publish this Resolution in a local newspaper within seven (7) days of adoption of this Resolution.

SECTION 4. That the City Clerk shall attest and certify to the passage and adoption of this Resolution and it shall become effective immediately upon its approval.

APPROVED AND ADOPTED THIS 18TH DAY OF MAY 2015.

ATTEST:

Eva M. Buice, MMC, City Clerk

CITY OF POMONA:

Elliott Rothman, Mayor

APPROVED AS TO FORM:

Arnold Alvarez-Glasman, City Attorney

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, EVA M. BUICE, MMC, CITY CLERK of the City of Pomona do hereby certify that the foregoing Resolution was adopted at a Regular Meeting of the City Council of the City of Pomona held on the 18th day of May 2015, by the following vote:

AYES: Nolte, Robledo, Carrizosa, Lantz, Escobar, Mayor Rothman
NOES: None
ABSENT: Martin
ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Pomona, California, this 19th day of May 2015.

Eva M. Buice, MMC, City Clerk

RESOLUTION NO. 2016-106

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA, CALIFORNIA, DECLARING A LEVEL 1 WATER SUPPLY SHORTAGE AND IMPLEMENTING LEVEL 1 RESTRICTIONS FOR WATER USE REDUCTION FOR OUTDOOR URBAN WATER USE AND MAKING CONSERVATION A WAY OF LIFE FOR POMONA WATER CUSTOMERS

WHEREAS, at the June 15, 2009 City Council meeting, the City Council adopted Ordinance No. 4122 a "Water Conservation and Water Supply Shortage Program" ("Water Conservation Program") that became effective immediately upon adoption pursuant to Water Code Section 376;

WHEREAS, the Water Conservation and Water Supply Shortage Program allows the City Council to declare by Resolution a water supply shortage level, and states that the conservation requirements shall take effect on the 10th day after the water shortage level is declared;

WHEREAS, on January 17, 2014, Governor Brown issued a Drought Emergency Proclamation (January 2014 Proclamation) due to the dire drought conditions and the need to conserve more;

WHEREAS, on February 24, 2014, the City Council adopted a Resolution to request a voluntary water use reduction by all City water customers in response to Governor Brown's Drought Declaration and Metropolitan Water District's (MWD) statement regarding California's Water Supply Shortage;

WHEREAS, On April 25, 2014, the Governor signed a secondary Executive Order to continue the State of Emergency due to the ongoing drought;

WHEREAS, On July 15, 2014, State Water Resource Control Board (SWRCB) adopted an emergency regulation to support water conservation (Resolution No. 2014-0038) and that regulation became effective July 28, 2014 after approval by the Office of Administrative Law (OAL).

WHEREAS, On March 17, 2015, the SWRCB adopted a Resolution to implement an Expanded Emergency Water Conservation requirement due to the continuing emergency drought conditions (Executive Order B-29-15) to safeguard the State's remaining water supply;

WHEREAS, On April 1, 2015, the Governor signed a subsequent Executive Order to mandate a Statewide reduction in water use of 25% from 2013 levels, elimination of irrigation of turf in medians with potable water, and issuance of fines for water violations;

WHEREAS, on May 5, 2015, the SWRCB adopted a Regulatory Framework to outline the Governor's Executive Order and mandatory actions that need to be taken by water suppliers;

WHEREAS, on May 18, 2015, the City Council adopted a Resolution to request Level 2 Water Supply Shortage and Use reductions by all City water customers in response to Governor Brown's Emergency Drought Declaration implementing limits of outdoor watering days to two-days per week from April through October, and one day per week November through March;

WHEREAS, on March 1, 2016, new urban water supplier conservation standards were set by the SWRCB, and required the City of Pomona to reduce by 20%, but was modified on March 15, 2016 to 18%;

WHEREAS, on May 9, 2016, the Governor issued an Executive Order that directs the SWRCB to adjust and extend the emergency water conservation regulations through the end of January 2017 in recognition of the differing water supply conditions for many communities;

WHEREAS, on May 18, 2016, the SWRCB adopted an emergency water conservation regulation that replaces the February 2, 2016 emergency regulation. The May 2016 regulation will be in effect from June 2016 through January 2017, and requires locally developed conservation standards based on each agency's circumstances. It replaces the prior percentage reduction-based water conservation standard with a localized "stress test" approach;

WHEREAS, the City of Pomona submitted the Water Supply Reliability Self-Certification form to the SWRCB by the June 22, 2016 deadline, and the data submitted demonstrated the City has adequate water supplies and facilities (with upgrades by 2017) to deliver the necessary water needs to the community for the next three-years, assuming three more dry years like the ones the State experienced from 2012 to 2015;

WHEREAS, due to the change in current water supply conditions, it is recommended that the City Council adopt a Resolution rescinding the Level 2 Water Supply Shortage and Use Restrictions (remove the two-days a week outdoor watering restrictions) which were originally adopted by Resolution No. 2015-41;

WHEREAS, although the water supply picture has improved, the City shall demonstrate good water conservation practices by continuing to conserve its water supply and make water conservation a "Way of Life" and preserve this precious natural resource; and

WHEREAS, a Level 1 Water Supply Shortage, which imposes mandatory restrictions on outdoor irrigation and limits the number of days per week that customers can irrigate outdoors, be declared and implemented by the City.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. In addition to the Water Conservation Program's permanent water conservation requirements established by Ordinance No. 4122, the City Council hereby declares a Level 1 Water Supply Shortage throughout the City and directs the City Manager to implement the following Level 1 water conservation requirements:

(1) *Limits on Watering Days:*
Watering or irrigating of lawn, landscape or other vegetated areas with potable water during the months of April through October is limited to no more than three (3) days per week on the following schedule:

- Odd addresses on Tuesday, Thursday and Saturday (addresses ending with 1, 3, 5, 7, 9)
- Even addresses on Monday, Wednesday and Friday (addresses ending with 0, 2, 4, 6, 8)

Watering or irrigation of lawn, landscape or other vegetated areas with potable water during the months of November through March is limited to no more than one (1) day per week on the following schedule:

- Odd addresses on Thursday (addresses ending with 1, 3, 5, 7, 9)
- Even addresses on Monday (addresses ending with 0, 2, 4, 6, 8)

This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when an emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by the use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 72 hours of notification by the City unless other arrangements are made with the City.

(3) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

SECTION 2. The City of Pomona shall comply with Governor Brown's Executive Order No. B-37-16 issued May 9, 2016, and the SWRCB emergency action to adopt section 864.5 and to readopt and further amend sections 863, 864, 865, and 866 in Title 23 of the California Code of Regulations, which pertain to drought emergency water conservation. The emergency regulatory action is effective on May 31, 2016, and will expire on February 28, 2017.

SECTION 3. In accordance with "Division 4 – Water Conservation and Water Supply Shortage Plan" of the Pomona City Code, the City Council hereby directs the City Clerk to publish this Resolution in a local newspaper within seven (7) days of adoption of this Resolution.

SECTION 4. That the City Clerk shall attest and certify to the passage and adoption of this Resolution and it shall become effective immediately upon its approval.

APPROVED AND ADOPTED THIS 18TH DAY OF JULY 2016.

ATTEST:

Eva M. Buice, MMC, City Clerk

CITY OF POMONA:

Elliott Rothman, Mayor

APPROVED AS TO FORM:

Arnold Alvarez-Glasman, City Attorney

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, EVA M. BUICE, MMC, CITY CLERK of the City of Pomona do hereby certify that the foregoing Resolution was adopted at a Regular Meeting of the City Council of the City of Pomona held on the 18th day of July 2016, by the following vote:

AYES: Nolte, Robledo, Lantz, Escobar, Martin, Mayor Rothman
NOES: None
ABSENT: Carrizosa
ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Pomona, California, this 19th day of July 2016.

Eva M. Buice, MMC, City Clerk

APPENDIX B

CITY OF POMONA NATURAL HAZARD MITIGATION PLAN

City of Pomona
Local
Hazard Mitigation
Plan Update
(2022-2027)

505 South Garey Avenue

Pomona, CA 9176

March 30, 2022

Table of Contents

LHMP Update Document Organization 7

1 INTRODUCTION 9

1.1 Background 9

1.2 Purpose of the LHMP 10

1.3 Related Mitigation Planning Efforts 11

1.4 Related City Plans And Documents 12

1.5 Planning Process 13

1.6 Stakeholder Participation 14

1.7 LHMP Implementation and Maintenance 20

2 COMMUNITY PROFILE 22

2.1 Introduction 22

2.2 Geography and the Environment 23

2.3 Historical Development 23

2.4 Climate 25

2.5 Geologic Conditions 25

2.6 Population and Demographics 28

2.7 Land Use Patterns 30

2.8 Housing and Community Development 34

2.9 Employment and Industry 34

2.10 Growth and Development 35

2.11 Transportation and Commuting Patterns 37

3 RISK ASSESSMENT 41

3.1 Introduction 41

3.2 Approach 41

3.3 Local Hazards Analysis 42

3.4 Critical Facilities 43

3.5 Vulnerable Populations and Facilities 48

3.6 Risk Identification and Vulnerabilities Summary 57

3.7 Potential Financial Losses 59

4 EARTHQUAKES 60

4.1 Introduction 60

4.2 Hazard Profile 60

4.2.1 *Historic Events* 61
4.2.2 *Hazard Location and Extent* 63
4.2.3 *Probability of Future Occurrence* 71
4.3 Vulnerability Assessment 72
4.3.1 *Identifying Vulnerabilities* 72
4.3.2 *Estimating Potential Losses* 79
4.3.3 *Climate Change Impact* 84
5 LANDSLIDES 86
5.1 Introduction 86
5.2 Hazard Profile 86
5.2.1 *Historic Events* 89
5.2.2 *Hazard Location and Extent* 92
5.2.3 *Probability of Future Occurrence* 96
5.3 Vulnerablility Assessment 96
5.3.1 *Identifying Vulnerabilities* 96
5.3.2 *Estimating Potential Losses* 97
5.3.3 *Climate Change Impact* 98
6 WILDFIRE 99
6.1 Introduction 99
6.2 Hazard Profile 99
6.2.1 *Historic Events* 101
6.2.2 *Hazard Location and Extent* 103
6.2.3 *Probability of Future Events* 103
6.3 Vulnerability Assessment 103
6.3.1 *Identifying Vulnerabilities* 104
6.3.2 *Estimating Potential Losses* 104
6.3.3 *Climate Change Impact* 104
7 FLOODING 110
7.1 Introduction 110
7.2 Hazard Profile 110
7.2.1 *Historic Events* 112
7.2.2 *Hazard Location and Extent* 112
7.2.3 *Probability of Future Events* 115

7.3 Vulnerability Assessment 116
7.3.1 *Identifying Vulnerabilities* 116
7.3.2 *Estimating Potential Losses* 117
7.3.3 *Climate Change Impact* 117
8 WINDSTORMS 118
8.1 Introduction 118
8.2 Hazard Profile 118
8.2.1 *Historic Events* 119
8.2.2 *Hazard Location and Extent* 119
8.2.3 *Probability of Future Events* 120
8.3 Vulnerability Assessment 120
8.3.1 *Identifying Vulnerabilities* 122
8.3.2 *Estimating Potential Losses* 122
8.3.3 *Climate Change Impact* 122
9 PANDEMIC/INFECTIOUS DISEASE 123
9.1 Introduction 123
9.2 Hazard Profile 123
9.2.1 *Historic Events* 123
9.2.2 *Pandemic/Infectious Disease Location and Extent* 125
9.2.3 *Probability of Future Occurrence* 126
9.3 Vulnerability Assessment 126
9.3.1 *Identifying Vulnerabilities* 126
9.3.2 *Estimating Potential Losses* 127
9.3.3 *Climate Change Impact* 127
10 GOALS AND OBJECTIVES 128
10.1 Introduction 128
10.2 Mission Statement 128
10.3 Goals And Objectives Framework 128
11 MITIGATION ACTION PLAN 132
11.1 Introduction 132
11.2 Existing Mitigation Activities 134
11.2.1 *Existing Earthquake Mitigation Activities* 134
11.2.2 *Existing Landslide Mitigation Activies* 138

11.2.3 *Existing Wildfire Mitigation Activities* 138
11.2.4 *Existing Flood Mitigation Activities* 140
11.2.5 *Existing Windstorm Mitigation Activities* 142
11.2.6 *Existing Pandemic/Infectious Disease Mitigation Activities* 143
11.3 Mitigation Action Items 144
11.4 Progress In Local Mitigation Efforts 158
Appendix A: Public Participation Survey Materials & Tac Meeting Agendas 160
Appendix B: Hazus Report 178
Appendix C: Resource Directory & Pomona Organizational Charts 201
Appendix D: Economic Analysis Guidelines For Natural Hazard Mitigation Projects 233
Appendix E: List Of Acronyms 240
Appendix F: Glossary 246

LIST OF TABLES

Table 1-1: Technical Advisory Committee 14
Table 2-1: Pomona Demographics 29
Table 4-1: Southern California Earthquakes with Magnitude 5.0 or Greater 62
Table 4-2: Modified Mercalli vs. Richter Scale 69
Table 4-3: Fire Stations Built Before 1976 73
Table 4-4: Expected Building Damage by Occupancy 80
Table 4-5: Displaced Households/Persons Seeking Short Term Public Shelter 80
Table 4-6: Casualty Estimates 81
Table 4-7: Earthquake Debris (millions of tons) 82
Table 4-8: Building Related Economic Loss Estimates (millions of dollars) 83
Table 4-9: Structures within Liquefaction and Landslide Zones 84
Table 8-1: Beaufort Scale 120
Table 9-1: Level of Community Transmission 125

LIST OF FIGURES

Figure 2-1: Regional Location 24

Figure 2-2: Topography and City Boundaries 26

Figure 2-3: Current Distribution of Existing Land Use 31

Figure 2-4: Transportation Network 38

Figure 2-5: Pomona Street Classification System 39

Figure 3-1: Critical Facilities 45

Figure 4-2: Regional Faults 65

Figure 4-3: PVHMC Specific Plan 75

Figure 4-4: Gas Transmission Lines in Los Angeles County 77

Figure 5-1: Landslide Types 87

Figure 5-2: Pomona Landslide 2010 90

Figure 6-1: Top 20 Largest California Wildfires 106

Figure 6-2: Top 20 Deadliest California Wildfires 107

Figure 6-3: Top 20 Most Destructive California Wildfires 108

Figure 8-1: Santa Ana Winds 118

LIST OF MAPS

Map 2-1: General Plan Land Use Map 33

Map 2-2: Zoning, Overlays, and Specific Plans Map 34

Map 2-3: Transect Zones 37

Map 3-1: Vulnerable Facilities Map 51

Map 3-2: Designated Historic Resources 57

Map 4-1: Seismic Hazards 65

Map 5-1: Landslide Hazards 96

Map 6-1: Areas Susceptible to Wildland Fires 111

Map 7-1: Flood Hazards 116

LHMP Update Document Organization

CITY OF POMONA LOCAL HAZARD MITIGATION PLAN UPDATE (2022-2027)

The City of Pomona is seeking FEMA approval for this Local Hazard Mitigation Plan Update. The City of Pomona *Local Hazard Mitigation Plan Update (2022-2027)* establishes the City's strategy to implement improvements and programs to reduce community impacts in the event of local hazards. Prepared pursuant to the federal Disaster Mitigation Act of 2000, the LHMP comprehensively identifies potential local hazards, the extent of the risks posed by the hazards, the vulnerabilities of the City to these hazards, and actions the City will take to mitigate or reduce the potential impact of the hazards. Pomona initially adopted a Natural Hazards Mitigation Plan in 2015. This 2022 – 2027 Local Hazard Mitigation Plan (LHMP) is an update of the Natural Hazards Mitigation Plan approved by FEMA in 2015.

While the frequency of disaster occurrence is low, Pomona is susceptible to major local hazards with potential for catastrophic consequences. The ensuing devastation could tremendously disrupt daily activities, commerce, and economic development as well as the functions of the City and other public agencies, in addition to causing untold tragedy in life loss and widespread injuries. Earthquakes top the list of local hazards with potential widespread impacts in Pomona, as well as wildfire, landslides, flooding, windstorm, and pandemic/infectious disease.

The LHMP builds upon preparedness and hazard reduction programs currently employed by the City. There are, however, a variety of risks with potential for considerable community impacts that require commitment of additional City resources and staff. By partnering with emergency response providers and community members in the implementation of the actions outlined in this document, the City can achieve a greater level of resiliency and will avoid major disruptions and upheaval associated with a natural disaster.

ORGANIZATION

The LHMP is organized into eleven Chapters, beginning with an introduction to the plan which examines the purpose, process, and implementation and maintenance, as well as public participation, and related planning efforts. Chapter 2 outlines the community profile including the demographics, geography, existing land use and development patterns that are critical to understanding how to mitigate local hazards. Chapter 3 assessing the vulnerabilities particular to Pomona, while Chapters 4 through 9 assess individual hazards. Chapter 10 outlines the City's goals and objectives for this LHMP, and Chapter 11 outlines existing and proposed mitigation efforts. The appendices provide supplementary information and resources.

The structure of the LHMP document is outlined below.

1. Introduction
2. Community Profile
3. Risk Assessment
4. Earthquake
5. Landslide
6. Wildfire
7. Flooding
8. Windstorm
9. Infectious Disease
10. Goals and Objectives
11. Mitigation Action Plan

Appendices

A. Public Participation Survey Materials & TAC Meeting Agendas
B. HAZUS Report
C. Resource Directory and Pomona Organizational Charts
D. Economic Analysis Guidelines for Local Hazard Mitigation Projects
E. List of Acronyms
F. Glossary

1 Introduction

1.1 Background

The City of Pomona is a desirable place to live with many attractive features: a favorable climate, diverse employment opportunities, historic downtown and neighborhoods, and more affordable housing than many of its neighboring communities. This quality of life attracts many new residents each year, resulting in a relatively steady growth rate over the last few decades. The population of Pomona grew from 149,058 in 2010 to 151,713 in 2019, a grow rate of approximately 1.8%[1]. Along with this growth, however, comes numerous challenges, one of which is how to effectively manage threats to the city resulting from a local hazard event. Southern California is home to a host of potential local hazards that could cause significant injury, loss of life, and property damage.

LOCAL HAZARDS

In Pomona, the greatest hazard threats are ground shaking and liquefaction from a major earthquake, although landslide, wildfire, flooding, windstorm events, and infectious disease also have potential to endanger people and/or property. As the City continues to grow, the exposure to these hazards increases, and the accompanying potential for negative impacts becomes even greater. Pomona's status as a nearly built-out city with limited natural open spaces, surrounded by substantially urban uses, affects the types of hazards and potential consequences of concern.

Pomona has been impacted by local hazards - namely earthquake and flooding in prior years. One of the most memorable disasters was a train wreck known to have occurred about 1900. The possible cause was a major earthquake registering approximately 6.5 on the Richter scale along the San Jacinto Fault on December 25, 1899. Over one hundred passengers were seriously injured. Because Pomona had no medical facility, injured passengers were taken into private homes and cared for by Pomona residents. This incident was the catalyst for Pomona to build a hospital, which today is Pomona Valley Hospital Medical Center. The Whittier-Narrows Earthquake of 1987 resulted in damage to many valued historic buildings, and several damaged unreinforced masonry buildings in the downtown area required demolition. Pomona has also had a long history of significant flooding in the eastern portions. Drainage improvements in the 1950s and 1960s and the construction of the San Antonio Dam have alleviated this hazard, although some localized flooding still occasionally occurs during heavy rainstorms (Reference 2).

To date, Pomona has not experienced disasters requiring a request for a Presidential Disaster Declaration and associated emergency assistance funds, with the exception of COVID-19 disaster

[1] *U.S . Census Bureau: United States Population and Housing Counts, 2010 and 2019.*
[2] *Gallivan, Mickey. President. Pomona Historical Society. Written Communication. June 22. 2004.*

declared on March 13, 2020, for the entire United States. The fact that a catastrophic situation requiring this request has rarely occurred should not in any way be interpreted as prediction of low hazard risk for the future. An event like the 1994 Northridge Earthquake, with damage totaling nearly 50 billion dollars, could realistically occur in Pomona.





Above. The derailment of a train in 1899 in Central Pomona prompted the construction of the City's hospital – Pomona Valley Hospital Medical Center. Traveling at high speeds, the train jumped track, potentially due to track damage caused by a large earthquake that occurred in the region on the same *day.*

HAZARD MITIGATION PLANNING

Exact prediction of disasters and the extent of impact on the city is impossible. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from local hazard events. Mitigation planning is an effective method of reducing risk from such local hazards. It is defined as "sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects[3]." This *Local Hazard Mitigation Plan* is the culmination of extensive research, analysis, and community outreach undertaken by the City of Pomona to identify potential local hazard risks and establish appropriate and effective mitigation to reduce the risks.

1.2 PURPOSE OF THE LHMP

In response to a series of costly and damaging disasters, Congress passed the Disaster Mitigation Act of 2000 (DMA 2000), which establishes a frame-work for proactive local planning for local hazard mitigation. This law requires that every local, county, and state government:

- Conduct an assessment of the local hazards that pose a threat to the jurisdiction;
- Determine the potential financial impact of these hazards;

[3] *Federal Emergency Management Agency, website:www.fema.gov, accessed September 14, 2021*

- Create a plan to mitigate these hazards; and
- Implement the plan to reduce the impacts of local hazards.

The preparation and adoption of such a plan is required in order to be eligible for funding from the Federal Emergency Management Agency (FEMA). This *Local Hazard Mitigation Plan* update for Pomona will ensure that the City is in compliance with this law and will be able to receive funding for mitigation projects and other assistance under DMA 2000.

As the costs of damage from local hazards continue to increase, the community realizes the importance of identifying effective ways to reduce vulnerability to disasters. Local Hazard Mitigation Plans assist communities in reducing risk from local hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City. This LHMP update establishes a set of action items to reduce risk from local hazards through education and outreach programs and to foster the development of partnerships, improvements to maximize emergency service response capabilities, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from local hazards.

1.3 RELATED MITIGATION PLANNING EFFORTS

The Pomona LHMP addresses local hazards, risks, and mitigation actions for the entire city. However, a variety of agencies and organizations have facilities in the city and take the lead on mitigation planning efforts for their facilities. LHMPs are under preparation or have been completed by the following for facilities located within Pomona:

- State of California Hazard Mitigation Plan, for State-owned facilities such as freeways, Cal Poly Pomona; and school district facilities, completed in 2013 and updated in 2018
- County of Los Angeles All Hazards Mitigation Plan, for County-owned facilities such as the courts; completed in 2014 and updated in 2019
- Pomona Valley Hospital Medical Center Emergency Operations Plan, completed in 1994 and most recently updated in December 2020.

Major utility infrastructure in Pomona is owned, operated, and managed by entities other than the City, such as Southern California Edison, Union Pacific Railroad, Southern California Gas Company, and the Los Angeles County Metropolitan Transportation Authority (MTA). Maintenance and emergency preparedness of these types of facilities are not under the City' s jurisdiction, although the City has a responsibility to coordinate with these infrastructure providers on emergency preparedness and risk reduction strategies, and advocate safety for Pomona residents, business, and property.

Partners and resources exist at the regional, State, and federal levels. Numerous State agencies have a role in local hazards and local hazard mitigation. Some of the key agencies include:

- The Governor's Office of Emergency Services (OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- The Southern California Earthquake Center (SCEC), gathers information about earthquakes, integrates this information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives;
- The California Division of Forestry (CDF) is responsible for all aspects of wildland fire protection on private, and state lands, and administers forest practices regulations, including landslide mitigation, on non-federal lands;
- The California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, the development of partnerships aimed at reducing risk of geologic and seismic hazards, including landslides and tsunamis; and
- The California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public and serves local water needs by providing technical assistance.

1.4 RELATED CITY PLANS AND DOCUMENTS

This LHMP update works in conjunction with other City plans and documents, specifically the General Plan, Zoning Code, the Emergency Operations Plan (EOP), and the Standard Emergency Management System (SEMS). The status of these documents is described below. The planning mechanisms in these documents will be amended to incorporate the LHMP mitigation actions.

POMONA GENERAL PLAN

The *Pomona General Plan* establishes a city-wide development plan and policies to help achieve the community's vision and goals for the City. Topics addressed in the *General Plan* include land use, circulation, economic development, urban design, historic and natural resources, open spaces, noise, as well as public safety. A comprehensive update of the *Pomona General Plan* was adopted in 2014. The Safety Element of the General Plan will be updated to address evacuation routes following the adoption of this LHMP update, and a comprehensive update to the General Plan will commence in the next 4-5 years. Through these updates, the City will seek to expand and improve on policies to reduce the risk of local hazards and will incorporate relevant information from this LHMP update.

ZONING CODE

The *Pomona Zoning Ordinance* establishes regulations for development in the City, implementing the General Plan policy framework. The Zoning Ordinance is currently being updated and will be revised to reflect the directives in the General Plan. The City will incorporate relevant information

from this LHMP update to reduce the risks of local hazards, through the incorporation of improved development standards and consideration of restricting growth in areas of the City subject to severe hazards.

EMERGENCY OPERATIONS PLAN (EOP) AND STANDARDIZED EMERGENCY MANAGEMENT SYSTEM (SEMS)

The Emergency Operation Plan (EOP) last updated in 2011 establishes the emergency organization, task assignments, policies and general procedures, and coordination of the various emergency staff and service elements utilizing the Standardized Emergency Management Systems (SEMS). The objective is to incorporate and coordinate all the facilities and personnel of the City into an efficient organization capable of responding to any emergency, as an extension of the California Emergency Plan. In the event of a large-scale local hazard, technological incident or national security emergency, the City would employ the communication protocols and systems for emergency response established in the *Standardized Emergency Management System Plan.* Mitigation actions have been included in this LHMP update that incorporate policies and procedures from the EOP and SEMS, and conversely, when the EOP is next updated, relevant mitigation efforts from this LHMP update will be incorporated.

1.5 PLANNING PROCESS

In preparing the LHMP, the City utilized a step-by-step planning process incorporating thorough research, analysis, and participation by stakeholders and community members. This planning process consisted of six major steps:

- Identification of issues pertaining to local hazards, community risks and vulnerabilities, preparedness, and awareness;
- Intensive research and mapping of hazards, critical facilities, and vulnerabilities to identify potential risks in Pomona;
- Rating of risks according to potential extent of damage, injury and life loss, and severity of service disruptions impairing community functioning;
- Formulation of mission, goals, and objectives;
- Evaluation of mitigation actions to reduce risks and improve preparedness; and
- Plan preparation.

Community members, stakeholders, and partners in emergency preparedness were involved in each step providing input and assistance as described below.

1.6 STAKEHOLDER PARTICIPATION

Emergency preparedness and response in a city like Pomona depends on the coordinated efforts of emergency service providers, infrastructure partners, community leaders, and residents themselves. To be comprehensive, feasible, and effective, mitigation planning for local hazards must proceed in coordination with these entities. For these reasons, a multi-component public participation program was integrated with the planning process for the LHMP. The public participation program included:

- Technical Advisory Committee (TAC) comprised of members representing City departments, school district, medical facilities, airport and transit facilities, and utility and emergency service providers who provided input;
- Public survey;
- City Council presentation;
- Communications with stakeholders and partners to acquire data and planning information.

Table 1-1: Technical Advisory Committee

NAME	TITLE	AGENCY/DEPT.	EMAIL
CITY			
Naela Cansino, ARM	Safety & Emergency Mgmt. Officer	Risk Management	naela.cansino@pomonaca.gov
Chris Millard	Risk Manager	Risk Management	chris.millard@pomonaca.gov
Linda Matthews	Human Resources/Risk Management Director	Human Resources	linda.matthews@pomonaca.gov
Rene Guerrero	Public Works Director	Public Works	rene.guerrero@pomonaca.gov
Benita DeFrank	Neighborhood Services Director	Neighborhood Services	Benita.defrank@pomonaca.gov
Anita Gutierrez	Development Services Director	Development Services	anita.gutierrez@pomonaca.gov
Chris Diggs	Water Resources Director	Water Resources	chris.diggs@pomonaca.gov
Lt. Steve Congalton	Watch Commanders Office	Police	steve.congalton@pomonaca.gov
HEALTH CARE/MEDICAL SERVICE PROVIDERS			
Steven Storbakken	Director of Emergency	Pomona Valley Medical Center	steven.storbakken@pvhmc.org

	Preparedness		
Rimmi Hundal	Director	Tri-City Mental Health	rhundal@tricitymhs.org
Lisa Naranjo	Program Supervisor	Tri-City Mental Health	lnaranjo@tricitymhs.org
Erica Frausto Aguado	Executive Director for Greater San Gabriel and Pomona	American Red Cross	erica.fraustoaguado@redcross.org
Jose De Leon	Facilities Manager	San Gabriel Regional Center	jdeleon@sgprc.org
UTILITIES			
Bob Cruz	Regional Public Affairs Manager	Sempra/SoCal Gas	rcruz1@semprautilities.com
Marissa Castro-Salvati	Local Public Affairs Regional Manager	Southern California Edison	marissa.castro@sce.com
AIRPORT & TRANSIT			
Sam Carter	Airport Manager	Brackett Airport	scarter@americanairports.net
Dave Price	Assistant Airport Manager	Brackett Airport	pocasstmgr@americanairports.com
Tanya Pina	Emergency Contact	Foothill Transit	tpina@foothilltransit.org
LaShawn Gillespie	Emergency Contact	Foothill Transit	lgillespie@foothilltransit.org
COUNTY EMERGENCY SERVICES			
Jim Robinson	Assistant Fire Chief	LA County Fire	jim.robinson@fire.lacounty.gov
Diana Manzano-Garcia	Disaster Area Management Coordinator	Area D Community Emergency Response Team (CERT)	dmanzano@areadonline.com
BUSINESS & COMMUNITY INTERESTS			
Lorena Parker	Executive Director	Downtown Pomona Owner's Association	lorena@downtownpomona.org
Rene Martin	Chairman	Ecumenical and Interfaith Relations Committee	rene.joseph.martin@gmail.com
Monique	President & CEO	Chamber of	mmanzanares@pomonachamber.org

Manzanares		Commerce	
Minerva Hernandez	President	Hispanic Chamber of Commerce	cdhpomona@gmail.com
Barry Gillies	Director of Property Operations	Pomona Fairplex	gillies@fairplex.com
Doreen Weatherly	Safety Services Manager	Pomona Fairplex	weatherly@fairplex.com
SCHOOL DISTRICT			
Richard Martinez	Superintendent of Schools	Pomona Unified School District	Richard.martinez@pomona.k12.ca.us

LHMP UPDATE SCHEDULE

- The City released a Request For Proposals from qualified firms to update the LHMP on August 3, 2020.
- LHMP update kickoff meeting occurred on March 25, 2021. The attendees were able to review the departments that were involved in the original preparation and identified representatives from outsides agencies that could be invited to be members. The LHMP City project manager provided a list of agencies and organizations that participated in the 2012 NHMP adopted in 2015, and Interwest staff contacted each organization to update contacts and initiate the outreach process via email and phone correspondence.
- The TAC agreed upon a planning process/public outreach method. A public outreach online survey would be used for the 2022 update due to the ongoing COVID 19 pandemic. A review process of this survey was undertaken and comments and/or changes were subsequently made.
- The TAC also reviewed the hazards listed in the 2015 document and added pandemic to the list of hazards. Weekly Update Committee meetings were held for the first several weeks of this LHMP update, then shifted to bi-weekly meetings in late May 2021.
- A link and QR Code for the public survey were posted to the City's LHMP Update webpage on June 28, 2021 and provided in English and Spanish. Advertisements for the survey were posted to Instagram, Facebook, the City's website and TV station, the electronic message board outside of City Hall, and in the Pomona weekly report through the months of July and August. Survey flyers were also handed out to the public at the Public Resource Fair on November 6, 2021.
- A public meeting to introduce the LHMP to the City Council was held on May 17, 2021. No members of the public attended the meeting. The presentation was given by City staff and Interwest Consulting Group staff, which resulted in a discussion about Pomona's proximity to several earthquake faults, drought, fires, and pandemic.
- Email correspondence with Technical Advisory Committee agency members began in the last week of May with correspondence continuing through November of 2021.
- Meetings with City Departments occurred from January through March to update Mitigation Action Items and other background information (Appendix A).

TECHNICAL ADVISORY COMMITTEE MEETINGS

- **March 25, 2021** – Kick-off meeting to introduce Technical Advisory Committee and project schedule.
- **April 12, 2021** – Meeting to determine public outreach strategy and COVID 19 limitations, addition of pandemic/infectious disease as a new hazard, and requirement to address impacts of climate change on local hazards.
- **April 19, 2021** – Review of public survey and determination of when and how to release to public. Discussed presenting the LHMP update to City Council.
- **May 3, 2021** – Discussed annexations and major construction projects since 2012. May 17, 2021, chosen as City Council presentation date.
- **May 17, 2021** – Reviewed Power Point presentation for City Council and launch of public survey after the City Council presentation.
- **June 1, 2021** – Discussed update to hazard maps and other maps relevant to the LHMP update.
- **June 14, 2021** – New Emergency Services Manager introduced to TAC team and to take over management of LHMP update.
- **June 28, 2021** – Update to project timeline and discussion strategy to increase participation of public survey.
- **July 12, 2021** – Updates provided relating to City demographics.
- **July 26, 2021** - Check -in on survey participation and request for related City documents.
- **August 9, 2021** – Discussion regarding area schools and hospitals.
- **August 23, 2021** – Request for information regarding City facilities including water facilities such as reservoirs.
- **September 6, 2021 –** Discussed changing document name from Natural Hazard Mitigation Plan to Local Hazard Mitigation Plan. Also, updated City staff on HAZUS Report.
- **September 20, 2021** – Confirmation of critical facilities (Police and Fire Stations) number and status.
- **October 4, 2021** – Discussed lack of participation in public survey and City events to present informational flyers with QR Code to public survey. Decided on November 6, 2021, Resource Fair.
- **October 18, 2021** - Discussed additional information from the Housing Element Update to include in the LHMP Update. Coordinated with Emergency Services Manager to begin outreach with City Departments to update Mitigation Action Plan.
- **November 1, 2021** – Discussed who would be present for the November 6 Resource Fair to hand out informational flyers and answer questions as Interwest staff members not available to attend.
- **December 13, 2021** – Reviewed initial responses to Mitigation Action Plan update.
- **January 10,2021** – Discussed need for more in-depth department interviews to address updates to Mitigation Action Plan.
- **January 27, 2021** – Interview with Director of Neighborhood Services to discuss outstanding items, and Mitigation Actions under Neighborhood Services responsibility.

- **February 3, 2021** – Interview with Directors of Public Works and Water Resources Department to discuss outstanding items, and Mitigation Action items under department responsibility.
- **February 7, 2021** – Interview with Emergency Services Manager to discuss outstanding items, and Mitigation Action Items under Risk Management Division responsibility.
- **February 14, 2021** – Interview with Director of Development Services to discuss outstanding items, and Mitigation Action Items under department responsibility.
- **March 7, 2021** – Interview with Police Department to discuss Mitigation Action Items under department responsibility.

ONLINE PUBLIC SURVEY

To better understand the community's understanding and concerns regarding natural hazards and local response, the City solicited input from the community in the form of an online survey to determine:

- How the community prioritizes hazards facing the City.
- Actions the City and community can take to reduce future damage from natural hazards.
- How local government officials can better communicate natural hazard risks to the public.

The survey included 12 questions and a comment section created to identify the respondent's connection with City of Pomona, experience with previous natural hazard events, preparedness for future hazards, and opportunities to create a community more resilient to local hazards.

To ensure the community had ample opportunities to provide input, the City promoted the survey using the following methods:

- City website – The City placed a link to the survey in a prominent location on the City's website homepage, ensuring all website visitors were aware of the opportunity.
- A City Council presentation introducing the Local Hazard Mitigation Plan and the importance of maintaining an up-to-date version of this LHMP. The presentation included information about the survey.
- Hard Copy surveys – The City provided paper (hard) copies of the survey at counters of City department offices including City Hall and handed out at the Resource Fair on November 6, 2021.

Outreach materials used to promote the public survey can be found in Appendix A.

PUBLIC SURVEY RESULTS

The following summary highlights the key responses and findings of the survey. These survey results help to inform staff of community concerns.

Community Participation

The City received responses to the survey from 62 individuals (62 in English, and 0 in Spanish).

Level of Concern

Respondents were asked to review the city's likely natural hazards and rate their level of concern on a scale from not concerned, not very concerned, neutral, somewhat concerned, to very concerned, for each local hazard. Climate change was identified as the highest level of concern among participants. While climate change is not identified as a specific hazard in this LHMP, it has the potential to impact all of the listed hazards, either directly or indirectly. Of the listed hazards in this LHMP, participants indicated the highest levels of concern for earthquakes, pandemics, and wildfire hazards/brush fire respectively pandemic which may have been temporarily inflated due to the fact that the worldwide COVID-19 pandemic was still ongoing at the time the survey was released. Lowest levels of concern include flood, dam failure and inundation hazards, severe windstorms, and landslides.

Actions to Prepare

The results of the survey indicate that many respondents have taken actions to reduce damage from a local hazard. The majority of respondents had purchased homeowners' insurance (75.81%), talked with family members about what to do in case of a disaster or emergency (54.84%), and prepared a "Disaster Supply Kit" (53.23%).

Local Government Efforts to Reduce Hazards

Respondents were asked to provide input as to the most important things the local government can do to help the community be more prepared for a disaster by ranking them as very important somewhat important, neutral, not very important or not important. Those following measures are ranked based on highest percentage of respondents identifying as very important:

Protecting critical facilities (hospitals, fire stations, etc.):	88.33%
Protecting and reducing damage to utilities:	80.33%
Strengthening emergency services (police, fire, ambulance):	75.41%
Protecting private property:	73.77%
Protecting the natural environment:	65.00%
Protecting K-12 schools:	61.67%
Promoting cooperation among public and private organizations and citizens:	59.02%
Preventing development in hazard areas:	57.38%
Protecting Colleges/Universities:	47.46%
Protecting small businesses:	45.90%
Protecting historical/cultural landmarks, museums, etc.:	37.70%
Protecting major employers:	24.59%

Community Assets

Respondents were asked to determine the importance of protecting the following community

assets for planning for local hazards. Those following community assets are ranked based on highest percentage of respondents identifying as very important:

Human: Loss of life and/or injuries:	90.32%
Governance: Ability to maintain order and/or provide public amenities/services:	77.05%
Infrastructure: Damage or loss of bridges, utilities, schools, etc.:	75.81%
Environmental: Damage or loss of forests, rangeland, waterways, etc.:	59.68%
Economic: Business closures and/or job losses:	56.45%
Cultural Historic: Damage or loss of libraries, museums, fairgrounds, etc.:	41.94%

Incorporation of Public Survey Results

Based on feedback gathered from the public survey, the Mitigation Action Plan focused on mitigations that would address the areas of deepest concern to the community such as protecting human life and property, preserving government facilities and services, improving local utilities and infrastructure, increasing community knowledge through public awareness campaigns.

Public Review Period

The draft 2021 LHMP was released for public review from April 4, 2022 through April 26, 2022. The release of the public draft LHMP was promoted through a variety of means including:

City of Pomona website

City of Pomona social media pages

Inland Valley Daily Bulletin

Hard copy at City Facilities

The public review period of the draft LHMP conclude on April 26, 2022. The public, and City staff provided comments and questions on the draft LHMP. No comments were received from the public, city staff, the TAC, public stakeholders, neighboring communities, or local and regional agencies during the public review period.

1.7 LHMP IMPLEMENTATION AND MAINTENANCE

Implementation of the updated LHMP will involve the coordinated efforts and commitment of City officials, City staff, emergency preparedness partners, and community leaders and residents. The timetable for implementation of the mitigation actions is five years, although a variety of actions will be ongoing once initiated. Other actions may take several years to complete, as detailed in **Chapter 11 Mitigation Action Plan**.

PLAN ADOPTION

The LHMP is intended to be adopted by the City Council, following review and comment by the State Hazard Mitigation Officer in the Governor's Office of Emergency Services, FEMA, and the public. Once adopted, the adoption resolution will be submitted to FEMA for final review and acceptance. Upon acceptance by FEMA, the City will regain eligibility for Hazard Mitigation Grant Program funds.

IMPLEMENTATION STRUCTURE

The Human Resources Department, Risk Management Division will take the lead in supervising implementation, working closely with the LHMP Committee. Each year in an Annual Report, priorities will be established for mitigation implementation, with consideration of cost-effectiveness per FEMA approved techniques. The City will update the LHMP every five years – in coordination with the LHMP Committee and with public input – by evaluating the effectiveness of mitigation implementation, addressing vulnerabilities, incorporating advancements in emergency response and post-disaster services, and updating hazard and risk assessments as new information becomes available. This includes incorporating new data from federal, State, or regional hazard mapping and delineation efforts.

The LHMP implementation structure is established in **Mitigation Action 1.1 in Chapter 11**, which should be referred to for more detail.

MAINTENANCE OF PLAN

The Human Resources Department, Risk Management Division will call an annual meeting that will consist of City departments, the general public and stakeholders to review the Local Hazard Mitigation Plan and take input for any changes or updates that might be needed to the plan. This meeting will take place in November and will be announced through the normal channels the City utilizes for meetings of this type.

2 Community Profile

This Community Profile provides background information on Pomona's geography, environment, population, and economy to better understand local hazards and vulnerabilities of the City. The 2014 *General Plan* is the source for much of the discussion in this chapter and should be referred to for greater detail on conditions, trends, and planning issues.

2.1 INTRODUCTION

Located in the highly urbanized Los Angeles metropolitan area, the City of Pomona shares many attributes with its neighbors. This includes a vulnerability to the volatile natural systems and features that distinguish the area. The semi-arid climate that attracts many people to the region also creates the conditions for fast-spreading wildfires. The infrequent but intense winter rainstorms can create the potential for flooding, should the flood prevention infrastructure ever fail. The hillsides that frame the Pomona Valley and that are home to well-established neighborhoods are also subject to destructive landslide conditions. And perhaps most dramatically, Pomona is located in one of the most earthquake prone urbanized areas in the United States.

Although situated in a high-risk metropolitan region, Pomona has been fortunate to avoid catastrophic local hazard events since its incorporation and development. Southern California earthquakes have impacted Pomona, although major damage has been limited. Fire has also impacted Pomona, although major wildfires such as the kind seen in recent years, have not spread into Pomona. Large scale flooding has not been a threat since the channelization of local creeks, and significant landslides have not caused widespread damage. Nevertheless, the threat of a local hazard event is always present. The potential for property loss and personal injury is particularly profound in Pomona due to its nearly built-out status. As the City continues to intensify with infill development, the risks, as well as the opportunity to build in mitigation, increases.

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

2.2 GEOGRAPHY AND THE ENVIRONMENT

The City of Pomona covers 22.84 square miles, or approximately 14,620 acres in eastern Los Angeles County, approximately 30 miles from downtown Los Angeles. To the west are the cities of the San Gabriel Valley and to the east is the fast-growing San Bernardino-Riverside region, as shown in **Figure 2-1 Regional Location**. The majority of the City is situated on the low-lying floor of the Pomona Valley and is bisected by major transportation corridors - freeways, rail corridors, and arterial roads. The San Jose and Puente Hills provide distinct edges to the northwest and southern boundaries, respectively of Pomona see **Figure 2-2 Topography and City Boundaries**.

Pomona is located on a gently sloping alluvial fan, which originates at the mouth of the San Antonio Canyon and slopes gradually to the south and southwest. Pomona is mostly characterized by flat topography (average slope in the valley floor area is a little under one percent) and there are only minor topographic variations except for the hillside areas to the northwest and south. Elevations in the City range from 1,100 to 1,300 feet in the San Jose and Puente Hills to 800 to 900 feet on the valley floor.
In general, the City is primarily urbanized, with limited open space and parks (221 acres, or 1.5% of total), and vacant areas (597 acres, or 4.1% of total). The City has no major water features, such as rivers or lakes; development patterns were defined in Pomona's early history by the railroad and later by the freeways. Creeks have been channelized and do not create significant physical boundaries.

2.3 HISTORICAL DEVELOPMENT

Pomona is one of the most well-established cities in the San Gabriel Valley. The City was initially plotted out in 1876 as a one square-mile townsite built around the Southern Pacific railroad station and the City itself was later incorporated in 1888, the fifth chartered City in Los Angeles County. Pomona started as a major center for citrus orchards, but also developed a well-defined town area. Residential neighborhoods soon developed, some of which are highly regarded for their exceptional architecture and style. These neighborhoods, along with the unique downtown core, give Pomona a historic character that is a source of community pride and an asset to be protected.

Today, Pomona is the seventh most populous city in Los Angeles County. It is a City with a diverse mix of people, neighborhoods, and business opportunities and has also developed into a very urban place. The City has a well-developed mixed-use downtown that is a center for arts and culture, and the site of substantial redevelopment and infill development.

Figure 2-1: Regional Location



2.4 CLIMATE

One of the Pomona's great assets is its Mediterranean Southern California climate. Average temperatures range from 41 degrees in the winter months to 89 degrees in the summer months. However, the temperatures can vary over a wide range, particularly when the Santa Ana winds blow from October to March, bringing higher temperatures and very low humidity. Temperatures rarely exceed 100 degrees in the summer months (June - September), nor drop below 30 degrees in the winter months (November-March).

Rainfall in the city averages 16.99 inches of rain per year. Over the recorded history of rainfall in Pomona, amounts have ranged from lows of seven inches in some years to 46 inches of rain in very wet years. Furthermore, actual rainfall in Southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. Because the metropolitan basin is largely built out, water originating in higher elevation communities can have a sudden impact on adjoining communities that have a lower elevation such as Pomona.

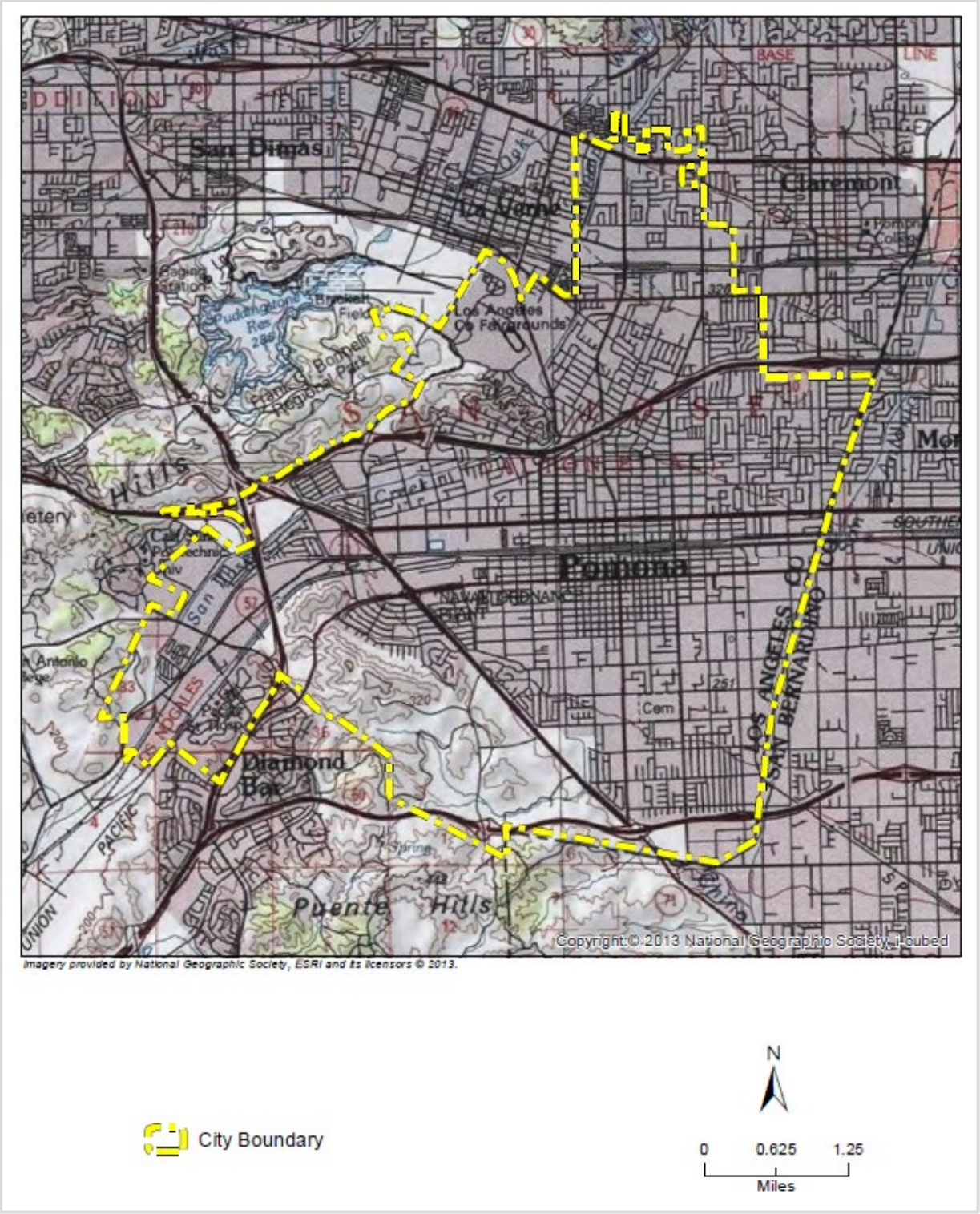
2.5 GEOLOGIC CONDITIONS

REGIONAL GEOLOGIC SETTING

Pomona lies within the western portion of the Transverse Ranges geomorphic province, characterized by numerous earthquake faults. The Transverse Ranges consist of a distinct group of east-west trending ranges and valley that truncate the prevailing north-northwest trend of the southern Coast Ranges and Peninsular Ranges. This region encompasses approximately 325 miles, and extends from Point Aguello, located along the western coast of California, eastward to Joshua Tree National Park, where it merges with the Mojave and Colorado Deserts.

Within the Transverse Ranges there are abundant compressional reverse and thrust normal faults, and curvilinear strike-slip faults that generally trend in an east-west direction. The foremost structural feature that has affected the geologic evolution of the region is the San Andreas fault. This fault has a northwest strike, located both to the north and south of the Transverse Ranges, but changes to a west-northwest strike within the Transverse Ranges, thus forming a bend in the fault. Many of these normal faults break the ground surface south of the San Andreas fault along the southern flank of the San Gabriel and Santa Monica Mountains. The thrust faults that break the surface south of the San Andreas fault dip southward and merge with the broad, buried fold and thrust belts that underlie the Los Angeles basin and the southern margin of the Transverse Ranges.

Figure 2-2: Topography and City Boundaries



REGIONAL FAULTS

The major faults that have the potential to affect the greater Los Angeles Basin, and therefore Pomona, are the San Andreas Fault Zone, Sierra Madre Fault System, Whittier-Elsinore Fault Zone, Verdugo Fault, Norwalk Fault, Santa Monica Fault, San Fernando Fault Zone, and the Newport-Inglewood Fault Zone. These faults are described in greater detail in **Chapter 4 Earthquakes**.

LOCAL FAULTS

In addition to the regional faults, there are several local faults located within the city that are considered potentially active. No recent seismic activity has been recorded along these faults in the last 10,000 years. However, a major earthquake occurring along any of these faults would be capable of generating seismic hazards and strong ground shaking effects within the city. These local faults include the Indian Hill, Chino, Central Avenue, and San Jose Faults. These faults are described in greater detail in **Chapter 4 Earthquakes**.

LOCAL GEOLOGIC SETTING

The City is underlain by alluvium within the valley area and underlain by bedrock on the San Jose Hills on the northwest and the Puente Hills on the southwest. The unconsolidated alluvial soils of the San Gabriel Valley came from the transport of soils from the San Gabriel Mountains to the north, as well as soils that washed out of nearby foothills and the San Antonio canyon area. The alluvial soils are underlain by igneous metamorphic rock, as seen in outcrops in the Puente Hills and San Jose Hills. Soils on the western valley area are made up of unconsolidated coarse sands and gravel near the San Jose Creek, and very fine grain unconsolidated silty sands along the foothills.

The Puente Hills are made up of marine sandstones and siltstones of the Puente formation, with a mixture of volcanic rock and outcrops. The Ganesha Hills are made of igneous metamorphic outcrops, as found on the San Jose Hills. The rocks are as much as 24,000 feet thick and consist of fine to course-grained marine elastic sedimentary rocks of the Cenozoic era (12 million years to 10,000 years ago). These rocks also include volcanic rocks and some non-marine sedimentary rocks.

MINERALS AND SOILS

The characteristics of the minerals and soils present in Pomona indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquake-induced ground shaking, liquefaction, and landslides.

Within the Pomona area, various soil associations are identified by the Natural Resources Conservation Service (NRCS). These soil associations consist of one or more soil types that have similar characteristics, and each is named for the predominant soil series it contains. Soil series within the City include Tununga-Sobada, Hanford, Cropley, Foster-Grangeville, Chino, Diablo-Altamont, Altamont-Diablo, San

Andreas-San Benito, San Benito-Soper, and Yolo. Generally, soils located in the western valley area comprise unconsolidated coarse sands and gravel, with very fine grain unconsolidated silty sands along the foothills.

Pomona is not located within a Significant Mineral Aggregate Resource Area (SMARA), as designated by the State Department of Conservation, nor is it located in an area with active mineral extraction activities.

2.6 POPULATION AND DEMOGRAPHICS

The City of Pomona has a population of about 151,713 people in an area of 22.84 square miles. The population has steadily increased from the late 1800s through 2020, and increased about 1.75 percent from 2010 to 2020, according to the 2020 Census. This rate of increase is similar the rate of increase for Los Angeles County as a whole over the same time period (1.95 percent).

Considering the historic trends, population growth is expected to continue in Pomona. This increase of people creates more community exposure, and changes how agencies prepare for and respond to natural hazards. For example, more people living in crowded neighborhoods can increase the risks associated with hazard events.

Furthermore, Pomona is experiencing a great deal of in-fill building, which is increasing the population density and creating greater service loads on the built infrastructure, including roads, water supply, sewer services, and storm drains.

According to the census 2019 American Community Survey 1-Year Estimates, the demographic make-up of Pomona is as follows:

Table 2-1: Pomona Demographics

Total Population	151,713
RACE	**% OF POPULATION**
White	21%
Black	5.8%
American Indian/Alaska Native	2.3%
Asian	10.7 %
Native Hawaiian/Pacific Islander	0.2%
Some Other Race	41.3%
Two Races	18.7%
Three Races	0.8%
Four Races	0.09%
AGE	
Median Age	34.3
Under 18 years	25%
Over 18 years	75%
LANGUAGE SPOKEN AT HOME	
English Only	34%
Spanish	56%
Other Indo European	1.1%
Asian and Pacific Islander	8.2%
Other Languages	0.6%
POVERTY BY AGE	
All	13%
Under 18 years	26.1%
Between 18 and 64 years	15.6%
65 years and over	12.9%
EDUCATION ATTAINMENT (POPULATION 25 YEARS AND OVER)	
High School or Equivalent Degree	23.6%
Some College, no Degree	21.1%
Associate's Degree	6.5%
Bachelor Degree	13.3%
Graduate or Professional Degree	4.8%
DISABILITY	
Total	11.8%
Hearing Difficulty	2.6%
Vision Difficulty	2.5%
Cognitive Difficulty	4.6%
Ambulatory Difficulty	6.2%
Self-Care Difficulty	2.6%
Independent Living Difficulty	5.4%
HEALTH COVERAGE	
Population w/out Health Coverage	11.2%

Natural hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed on special needs groups, women, children, minorities, and the poor. The ethnic and cultural diversity in Pomona suggests a need to address multi-cultural needs and services as described below.

Census data indicates that the number of Pomona residents in poverty decreased from 2010 to 2019. About 13 percent of the population in Pomona was determined to have poverty status in the 2019 estimates, less than the County at 13.4 percent of the population.

Vulnerable populations, including seniors, disabled citizens, women with children, as well as those people living in poverty, may be disproportionately impacted by natural hazards. In Pomona, the percentage of the population over 65 has increased from 7.6 percent in 2010 to approximately 10.6 percent in 2019. However, the percentage of residents under 18 years of age has decreased from 29.6 percent in 2010 to approximately 25 percent in 2019.

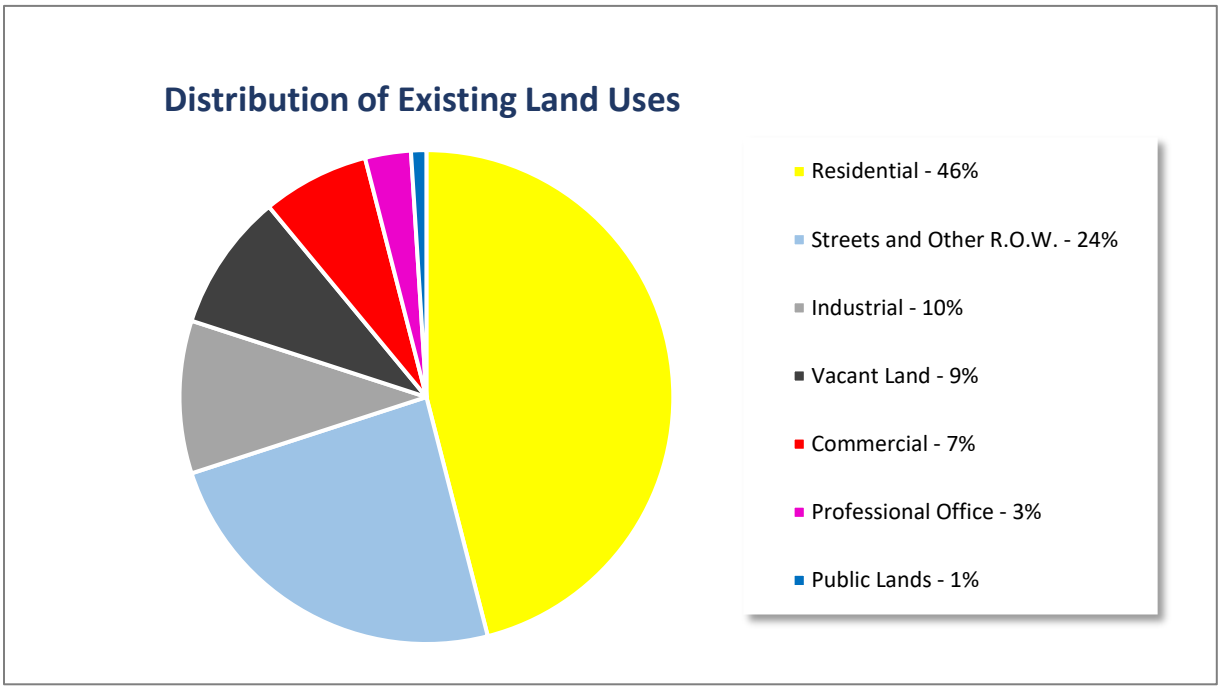
Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of natural hazards recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about natural hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

2.7 LAND USE PATTERNS

Pomona is a highly urbanized city with a rich history that is reflected in its current development pattern and diverse mix of land uses, building types and styles, and neighborhoods. The City is almost entirely built-out with only 9 percent vacant land and a 1 percent of public lands. The distribution of existing land uses is shown in **Figure 2-3 Current Distribution of Existing Land Use**.

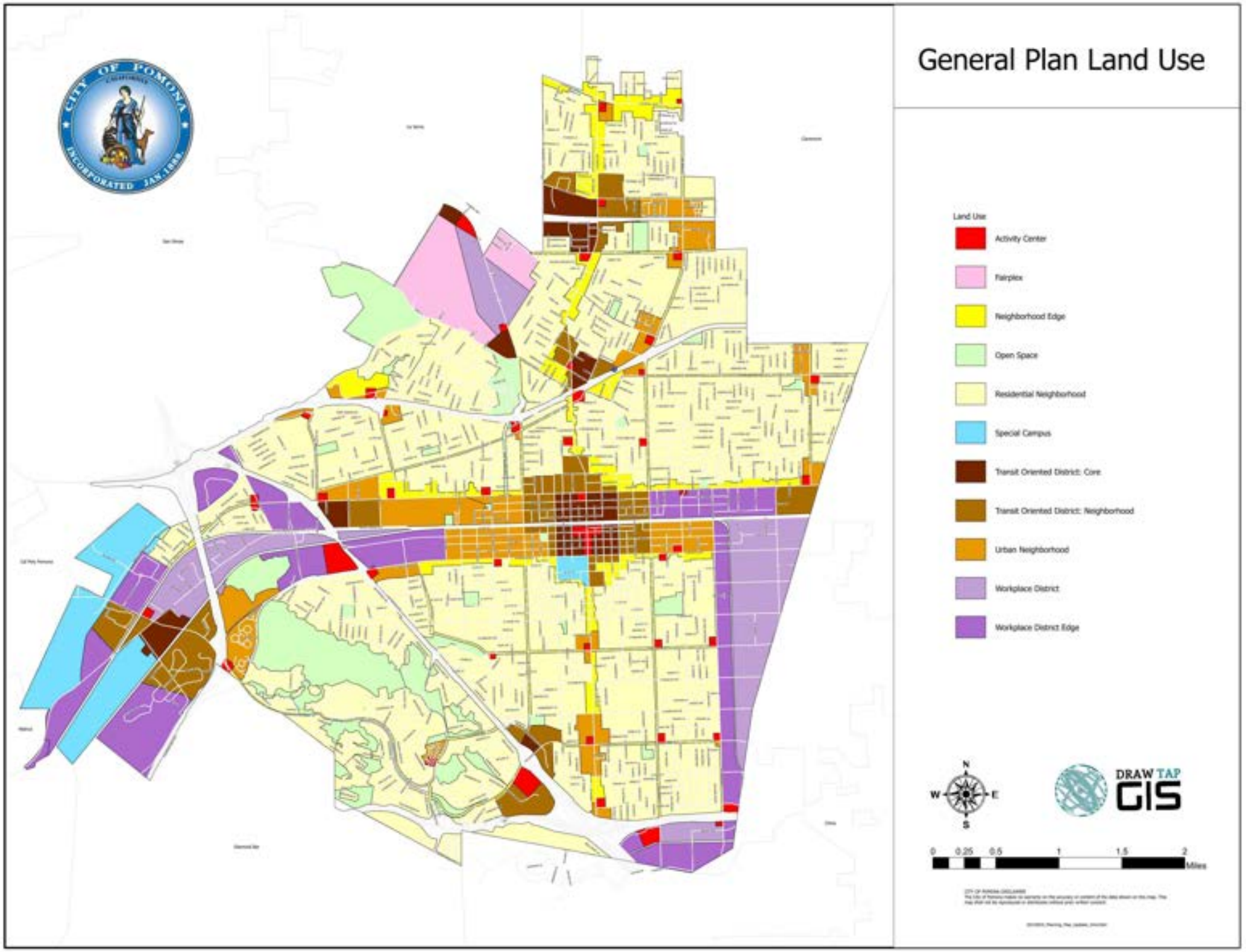
Figure 2-3: Current Distribution of Existing Land Use



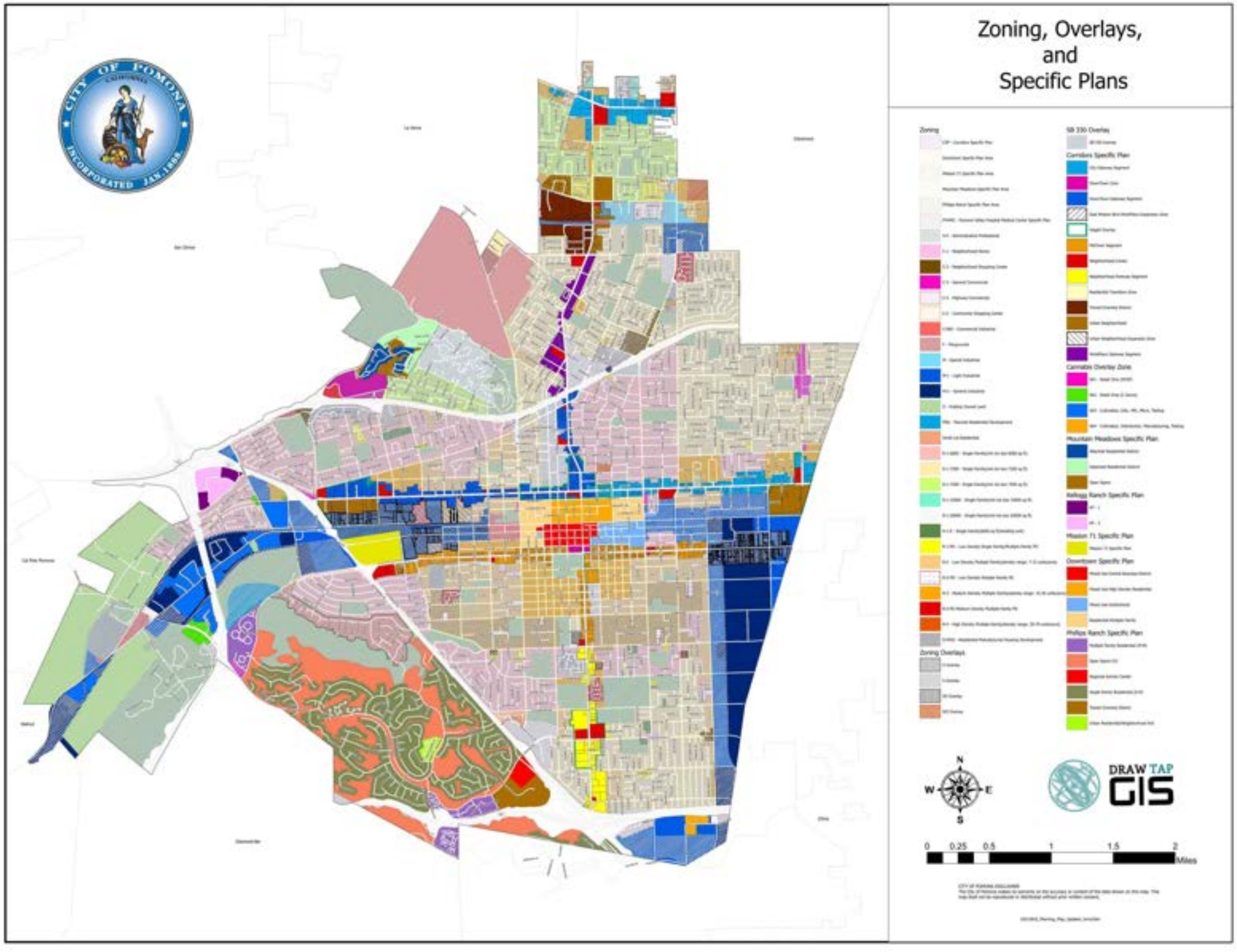
Above. Information provided by City staff June 2022.

Overall, Pomona's development pattern is typical of a city of its age, topography, and western U.S. location. Even in the city center, topography and lack of physical constraints has allowed for a relatively uniform street grid with residential neighborhoods and commercial corridors radiating outwards from the traditional mixed-use downtown core. Residential neighborhoods located further away from the downtown and along the hillsides to the north and south were built later in the 20th century and are more uniformly residential in use. At the western and eastern edges of Pomona, large industrial areas have developed with access to the railway and major transportation arteries.

Map 2-1: General Plan Land Use Map



Map 2-2: Zoning, Overlays, and Specific Plans Map



2.8 HOUSING AND COMMUNITY DEVELOPMENT

Although the cost of housing in Pomona is increasing and there is a lack of vacant land for new single-family residential homes, the mix of housing types has remained relatively consistent in recent years. Single-family residential is the primary housing type (69.5 percent of the total), with the remainder consisting of multi-family (26.2 percent) and mobile homes or other (4.3 percent). The majority of homes in Pomona are owner-occupied (57.4 percent of non-vacant units). The remaining 42.6 percent are renter- occupied. In order to increase the availability of housing units and meet its RHNA allocation, Pomona has adopted several ordinances, specific plans, and overlays to increase densities in the remaining developable land in the city.

Pomona has an older central district established during the City's early years of development, but what is not as readily apparent in the housing age statistics is the disparity of maintenance in many Pomona neighborhoods. While some of Pomona's older neighborhoods are remarkable for their largely excellent condition, there are also many areas that have become dilapidated. The condition of many of the City's older homes requires significant investment in renovation to bring them up to contemporary standards. The risk of property damage and injury is heightened in areas of older homes. To address housing issues, Pomona's Housing Division provides a number of programs including rental assistance, homebuyer mortgage assistance, housing rehabilitation, and facade improvement programs.

Overall, Pomona's annual median household income (2019) of $67,202 was about 7.6 percent less than the countywide average. About 15 percent of Pomona households earned an average annual income of less than $25,000.

2.9 EMPLOYMENT AND INDUSTRY

Pomona's job base is undergoing changes initiated by the closure of aerospace and manufacturing facilities in the late 1980s and early 1990s. Although the loss of large employers such as General Dynamics has had a negative impact. The COVID 19 pandemic has also significantly increased the unemployment rate in Pomona, particularly in the service industries, though the unemployment rate was highest between the months of March through July of 2020 and have already started to rebound.

Although employment growth has been negative, there have been other impacts from the job base changes. With the loss of major employers, Pomona has seen an increase in the diversity of job types and a shift to a wider range of smaller enterprises. This presents a challenge in coordinating with major employers to ensure the safety and welfare of workers and limit damage to industrial infrastructure. There is also a need to increase the number of high paying jobs.

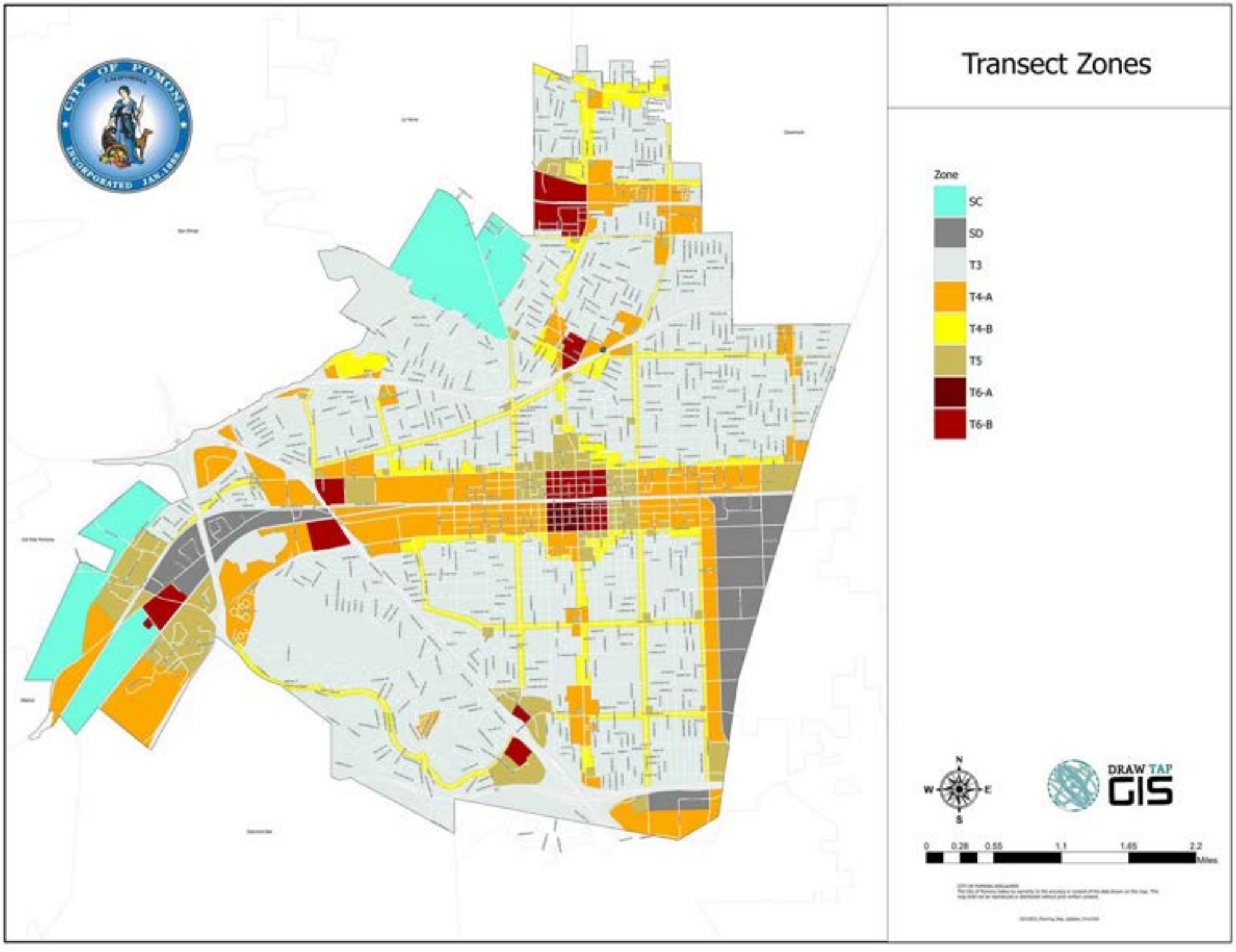
2.10 GROWTH AND DEVELOPMENT

As discussed in **Chapter 1 Introduction**, Pomona is located at the boundary of the highly urbanized metropolitan counties of Los Angeles and San Bernardino. It is surrounded and contained by the cities of Claremont, La Verne, San Dimas, Walnut, Diamond Bar, Chino, and Montclair. Within Pomona, all of the large land areas are developed, including most of the more remote hillsides. The remaining undeveloped land is either not suitable for development or has been set aside to remain as open space.

Although the City is considered built-out, development continues and is expected to continue to meet market demand created by population growth. Because there is a lack of available land suitable for development, new development will be primarily infill, reuse, and intensification.

Addressing the challenge of accommodating projected growth within the urban fabric of the City is a major goal of the 2014 *General Plan.* As part of this effort, a comprehensive assessment of areas in the City with potential for infill development, redevelopment, land use change, and/or development intensification has been conducted. The results of this assessment have resulted in the formulation of Transect Zones, which depict future density and intensity patterns that the General Plan identified the City could accommodate, as shown in **Map 2-3**.

Map 2-3: Transect Zones



Addressing the local hazard mitigation issues in an urbanized City like Pomona are different from those encountered in a community with room to expand outward. Due to its built-out status, future growth in Pomona will not stretch into undeveloped areas that could present additional natural hazard risks; rather, development will be integrated int o the existing urban fabric and affected by the same natural hazards that face the community in its present state. Challenges involved in mitigating risks associated with infill development primarily include concerns about the increase of risk from higher densities, some in already overcrowded neighborhoods. However, redevelopment also creates the opportunity to upgrade or replace older building stock with new construction that conforms to modern building codes. These include regulations for structural resistance to earthquakes, landslide mitigation efforts, fire-resistant materials, and elevation above flood levels. From a hazard mitigation perspective, through the replacement or renovation of older structures and infrastructure, infill and redevelopment can increase the City's safety significantly.

The primary way to mitigate hazard impacts on future development is to create hazard resilient development and infrastructure. Policies formulated in this document address this need and are discussed in detail in **Chapter 11 Mitigation Action Plan**.

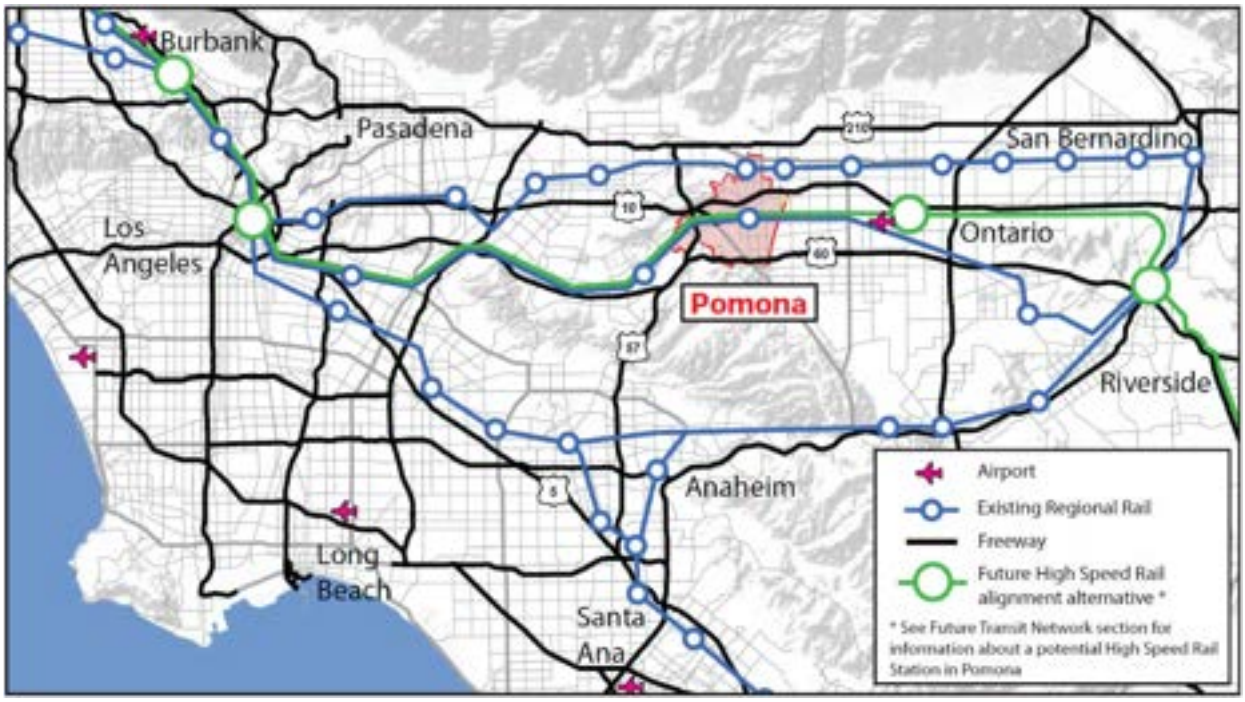
2.11 TRANSPORTATION AND COMMUTING PATTERNS

TRANSPORTATION INFRASTRUCTURE

Pomona is centrally located within the greater Los Angeles-San Bernardino-Riverside region. As such, the City is traversed by a number of key regional transportation routes, notably the five major freeways and two rail lines that provide passenger and freight access and connect Pomona with the Inland Empire, Los Angeles and Orange County (see **Figure 2-4 Transportation Network**). In addition, Ontario International Airport, located just ten miles to the east, has established itself as a major gateway to the region, serving approximately six million passengers annually.

The well-developed street system in the City provides access to and from the regional facilities described above and accommodates travel for various modes of transportation (automobiles, trucks, buses, bicycles, and walking). The local system and regional access provide many opportunities for Pomona residents to travel within their city and region, and well beyond. The road system is also complimented with service from three transit agencies (Los Angeles County MTA, Foothill Transit, and Omni Trans) and two lines of the Metrolink commuter rail system.

Figure 2-4: Transportation Network



The five major freeways provide east-west, and north-south access as follows:

- The San Bernardino Freeway (I-10) and the Pomona Freeway (SR-60) provide east-west access to Pomona from Santa Monica and Los Angeles to the west, and Ontario, San Bernardino, and Riverside to the east. The Foothill Freeway (I-210) provides an additional east- west connection to the north of Pomona, extending west to Pasadena and the San Fernando Valley.
- The Corona Expressway (SR-71) and Orange Freeway (SR-57) provide connections with Corona and Orange County.

Figure 2-5: Pomona Street Classification System



The City's 296-mile road system includes 28.2 miles of major arterials, 45.8 miles of minor arterials, 36.7 miles of collector roads, and 184.4 miles of local roads. **Figure 2-5** shows the local network of arterial collector, and local streets, which is generally organized as a traditional grid.

Overall, traffic volumes are quite high in the City. In places, Temple Avenue carries close to 33,000 vehicles per day, while seven other arterials carry in excess of 20,000 vehicles per day. Most other arterials carry between 10,000 and 20,000 vehicles per day, while all collectors for which data is available, carry less than 10,000 vehicles per day. As traffic volumes rise, there is an increased risk that a natural hazard event will disrupt the travel plans of residents across the region, as well as local, regional and national commercial traffic.

In addition to the transportation access for residents, Pomona is well located for goods transportation. In addition to the freeways, two major rail lines traverse the city, including the Alameda Corridor East, which links Pomona to the Ports of Los Angeles and Long Beach.

TRENDS AND ISSUES

Although there are many routes traveling through or near Pomona, population growth in the region, particularly in the fast-growing Inland Empire area, has put a considerable strain on the regional freeways serving the City. Transportation patterns have become more complex, as the traditional "suburb to central city" journey to work has been replaced by multi-directional travel patterns due to job growth in dispersed locations. Vehicle and rail volumes are increasing in the area. Freeway congestion has become an acute problem in the region. In Pomona, there are significant level of service deficiencies along I-10, at the interchange of I-10, SR-57, and SR-71.

The amount of rail traffic through Pomona is also substantial, roughly 80 freight trains per day. This number is expected to increase following improvements to the Alameda Corridor, which includes the Union Pacific Railroad, potentially up to 151 trains per day. This is a serious concern for the hazards mitigation planning effort in that only three grade separated crossings are in place for local traffic and emergency vehicles to cross the Alameda Corridor. However, the Alameda Corridor East project does provide for improvements in Pomona including median improvements, traffic signal improvements, construction of new sidewalks and construction for two new grade separations, one at East End Avenue and one at Temple Avenue.

3 Risk Assessment

3.1 INTRODUCTION

The critical step in hazard mitigation planning is comprehensive risk assessment. This involves first understanding the types of hazards that could occur in the City, and then determining the range of risks to the community from each of the hazards. Mitigation is then formulated to avoid or reduce the identified risks, thereby facilitating a safer and more resilient environment for residents and business when implemented. This chapter overviews the risk assessment process, including documentation of the approach employed in the LHMP planning process in Pomona, description of critical facilities and vulnerable populations, and summary of the identified risks.

3.2 APPROACH

The approach employed for risk assessment for the Pomona LHMP was designed to identify all possible risk scenarios, determine the potential impact to the community associated with each risk, and then accordingly prioritize risks having greater potential impacts to be targeted in the mitigation actions. The steps in this process, conducted in coordination with the Technical Advisory Committee (TAC) and with input from community members, included:

- Determination of hazard threats in Pomona by way of researching existing databases and discussions with the TAC, a process that resulted in focusing the Pomona LHMP on 1) earthquake-induced ground shaking, liquefaction, and landslide, 2) wildfire, 3) flooding, 4) windstorm, and 5) pandemic/infectious disease (see **Section 3.3** below and **Chapters 4 to 9**);

- Hazard identification and profiling, including documentation of the geographic extent, potential intensity, and the probability of occurrence of the local hazard with potential to affect Pomona, using the best available data (see **Chapters 4 to 9**). As an update from the last plan, consideration of the impacts of climate change on each of these hazards was also included in the plan update;

- Inventory of critical facilities, defined as services and infrastructure that are essential to emergency response and community function: examples include fire and police services, hospitals, circulation, and water and sewer systems (see **Section 3.4**);

- Inventory of vulnerable populations, defined as people who are particularly susceptible to impacts of a local hazard event and may have special post-disaster needs: examples include populations in schools, childcare facilities, and overcrowded neighborhoods (see **Section 3.5**);

- Consideration of risk scenarios for critical facilities and vulnerable populations utilizing the hazard information on extent, intensity, and probability;
- Rating risk scenarios according to potential impact on the community, with consideration of geographic extent, potential for disruption of emergency and essential services, duration, and potential for population injuries, fatalities, and/or dislocation (see **Chapters 4 to 9**); and
- Risk analysis, involving quantification of vulnerabilities in terms of dollar losses, where appropriate data was available (see **Chapters 4 to 9**).

3.3 LOCAL HAZARDS ANALYSIS

Pomona is potentially subject to risks associated with earthquakes, landslide, wildfire, flooding, windstorm, and pandemics/infectious disease. The greatest local hazard threats with potential for widespread injury, life loss, property damage, and prolonged disruption in Pomona are ground shaking and liquefaction associated with a major earthquake. Pomona is located in a seismically active region of Southern California, with several damaging earthquakes having occurred just in the past twenty years.

Important but potentially less destructive hazard threats (due to more limited geographic extent) include landslide associated with steeper slopes and wildfire associated with the remaining open spaces. Flooding occurs in some limited areas occasionally disrupting circulation arterials, and there is a risk- albeit very low- of flooding from dam inundation. Windstorm conditions resulting from strong seasonal Santa Ana winds occur, but the impact to the community is low relative to the potential impacts of other local hazard events.

At the time this plan update is being written, Pomona and the rest of the world are in the midst of a global pandemic caused by the Covid-19 virus. The pandemic has had far reaching health, social, educational, and economic impacts. This plan update incorporates a chapter specifically on pandemics/infectious disease.

Also new to this plan update is specific discussion of the implications of climate change on each hazard, contained within the hazard profiles.

Complete local hazard descriptions which include hazard identification and profiles, maps, and potential risks-are set out in separate chapters as follows:

- Chapter 4: Earthquake
- Chapter 5: Landslide
- Chapter 6: Wildfire

- Chapter 7: Flooding
- Chapter 8: Windstorm
- Chapter 9: Pandemic/Infectious Disease

3.4 CRITICAL FACILITIES

Following a local hazard event, the primary goals of the City emphasize maintaining services that are key to the functioning of Pomona. By identifying critical facilities that lie within potentially hazardous areas, the City can help to prepare for and minimize debilitating impacts on these services. The following is an overview of the critical facilities in Pomona. With the exception of utilities, which have been omitted for security purposes, the critical facilities are mapped in **Figure 3-1**.

GOVERNMENT EMERGENCY OPERATIONS FACILITIES

Maintaining the continuity of government during a local hazard event is essential in order to respond to emergencies, protect life and property, and recover in the aftermath of an event. The City of Pomona has formulated a comprehensive strategy to ensure proper functioning of the government during a crisis. This strategy is laid out in the City's *SEMS* (Standardized Emergency Management System), part of the City's Emergency Operations Plan. The SEMS designated several sites as centers of emergency operation, communication, and governance during an emergency. Alternates for these facilities are also designated, in the event that the original facility is not operational. As shown in **Figure 3-1**, the majority of these facilities are centrally located in downtown Pomona, which is the " hub" of government emergency operations. Also located in close proximity, and in some instances serving as government operations facilities, are the headquarters of the Police and Fire Departments that serve the City.

EMERGENCY SERVICES

Police Services

The Pomona Police Department provides local police services for the City of Pomona. The primary facilities include the main headquarters and jail, the training bureau, the traffic bureau, and an aero bureau, which is located at Brackett Field in the City of La Verne. Pomona Police Department headquarters are located at 490 W. Mission Boulevard.

Fire Services

The Los Angeles County Fire Department (LACoFD) serves the City of Pomona. Pomona is part of the LACoFD Division VIII, located on the eastern boundary of the Department's jurisdiction. In addition to the City of Pomona, Division VIII includes the neighboring cities of Diamond Bar,

Walnut, Industry, La Puente, and the unincorporated communities of Avocado Heights, Bassett, Hacienda Heights, Rowland Heights, and Valinda. Seven of the 19 fire stations in Division VIll are located in Pomona. If necessary, resources in the City's adjacent jurisdictions provide additional support.

Fire stations are strategically located throughout the City to provide prompt assistance to area residents. Each fire station operates with in a specific district that comprises the immediate geographical area around the station. Approximately 83% of the City is located within a one-mile radius of a fire station in Pomona. Division headquarters are located in Diamond Bar and Battalion 15 headquarters are located at 590 S. Park Avenue, at Station 181.

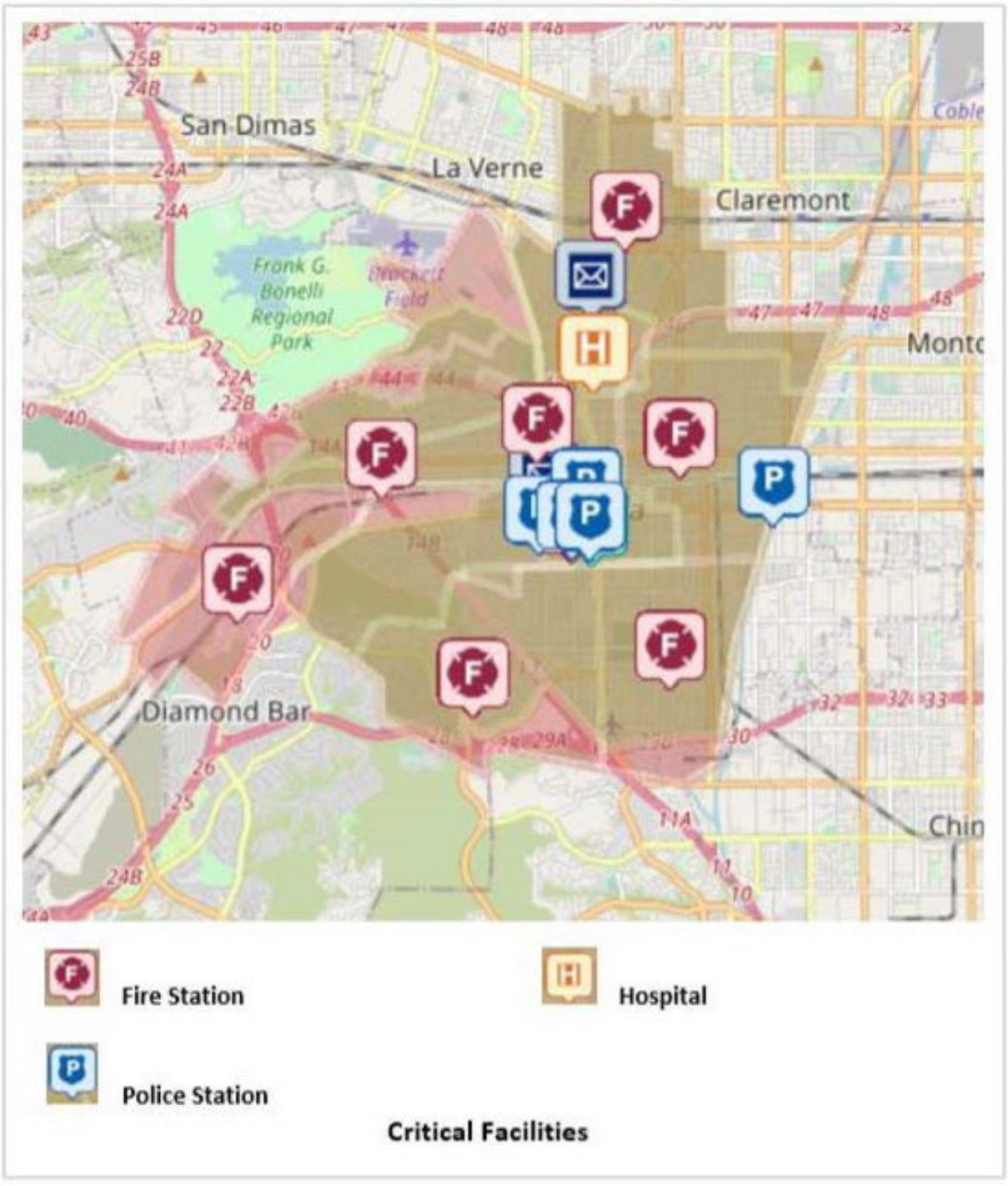
HOSPITALS

There is one major critical health care facility in Pomona, the Pomona Valley Hospital Medical Center. This facility is located at 1798 N. Garey Avenue. In addition to Pomona, it serves Eastern Los Angeles and Western San Bernardino Counties. It contains 412 beds, 70 emergency beds, and offers a complete range of medical services including general medical and surgical care, general intensive care, cardiac intensive care, open heart surgery, neurology, pediatrics, obstetrics, and neonatal intensive care. A staff of 700 physicians, 3,700 employees and more than 1,000 volunteers manage over 85,000 inpatient days, 5,000 newborn deliveries, and more than 75,000 ER patient visits.[4]

Two other hospitals serve the City of Pomona: Casa Colina Hospital for Rehabilitative Medicine and American Recovery Center. However, these facilities provide specialized care to treat specific illnesses, and would not be primary providers of emergency medical aid in the event of a disaster. A further discussion of these hospitals is presented in the following section on vulnerabilities. Other facilities, such as the county-operated Pomona District Health Center and the East Valley Community Health Center, provide important primary care services, but due to their limited size and services are not considered critical or vulnerable facilities for the purposes of this plan.

[4] *Correspondence with PVHMC staff, September 2021.*

Figure 3-1: Critical Facilities



TRANSPORTATION

There are five major freeways serving Pomona that provide primary regional access to and from the City. The I-10 and SR-60 freeways provide east west access to Pomona from Santa Monica

and Los Angeles to the west, and Ontario, San Bernardino and Riverside to the east. The I-210 freeway provides an additional east west connection to the north of Pomona, extending west to Pasadena and the San Fernando Valley. The SR-71 and SR-57 freeways provide connections with Corona and Orange County.

In addition to the five freeways passing through the City, Pomona has an extensive street network. Classified as arterials, collectors, and local roads, Pomona's roads carry many thousands of vehicle and transit trips daily. Pomona's street network is primarily based on a grid, with several major north-south and east-west roadways interlaced with a system of intersecting minor streets.

Three railroads currently cross Pomona, which generally run east-west. Two railroad lines, located in the center of the City, are operated by Union Pacific Railroad (UPR) and are part of the Alameda Corridor. One of these lines was formerly the Southern Pacific Line (SPL) and is still marked as and commonly referred to under that name. The UPR tracks carry both freight and passenger trains. The northernmost railroad tracks were formerly operated by Atchison Topeka and Burlington Northern Santa Fe Railroad (BNSF). They are currently owned by the Los Angeles County Metropolitan Transportation Authority, which operates passenger trains on the line (Metrolink).[2]

The UPR located roughly between Holt Avenue and Mission Boulevard, bisects the center of the City and could be a significant impediment to north-south transportation if a train derailed within the City. Damage to the UPR tracks would also have far-reaching economic effects; the line is a major regional freight transportation artery. The location in Pomona is one through which all eastbound and westbound rail traffic must pass in Southern California. As part of the Alameda Corridor, the UPR will experience substantial structural improvements and increases of train traffic in the future.

A light rail passenger train extension of the Gold Line is currently under construction. The current phase will extend the Gold Line from Glendora to Montclair. Construction is currently underway through the cities of Glendora, San Dimas, La Verne, and Pomona, and the line extension is anticipated to be operational in 2025. Once completed, four and five tracks will run through the city of Pomona (depending on the location in the city). Tracks will run in two separate rail corridors – one on the north for the Gold Line and freight, and one on the south for Metrolink and freight. While Gold Line trains and freight trains share the northern corridor, they will not share tracks. Therefore, the freight tracks that currently run in the middle of the north corridor will be relocated to the northern half of that corridor, to make room for the Gold Line tracks to be built in the southern half. The Metrolink/freight corridor on the south will remain as is today and is not part of the Gold Line project.[5]

Each of the highways, freeways, and railroads are considered critical facilities in Pomona. A

[5] *https://foothillgoldline.org/cities_stations/pomona/, accessed September 2021.*

hazard that rendered these routes impassible would pose a significant challenge to the City in responding to and recovering from the event.

UTILITIES

Pomona is a large city, 23 square miles in size, and it is traversed by hundreds of miles of streets, transmission lines, pipelines, and other facilities that enable proper functioning of the utility systems that serve Pomona. Although each of the parts contribute to the health of these systems, it is infeasible to detail every component involved in Pomona's utility networks. This section, therefore, provides a brief description of utility services in the City, then summarizes the few critical facilities that contribute most to proper system functioning.

Water

The City of Pomona adopted a Water Master Plan in 2005 and subsequently adopted an Integrated Water Resource Management Plan in 2011.

The 2005 Water Master Plan indicated that the existing potable water system consisted of approximately 421 miles of pipelines, 22 storage reservoirs, 15 booster pumping stations, 41 groundwater wells (38 potable, 3 recycled), 4 imported water connections, 2 inter agency connections, 5 water treatment plants, 28 pressure regulating stations, 6,000 fire hydrants, and 11 pressure zones.[6]

Sewer

Wastewater service within Pomona is provided by the City's Utility Service Department, and the Los Angeles County Sanitation District (LACSD) treats wastewater from the City's system. A majority of the City's wastewater is treated and disposed of at the LACSD's Pomona Water Reclamation Plant (PWRP).[7] The plant occupies approximately 14 acres northeast of the intersection of the SR-57 and SR-60 Freeways. Sewage effluent from the neighboring cities of La Verne and Claremont is also treated at the PWRP.[8]

The City of Pomona adopted a Sewer System Master Plan in 1990 and updated the plan in 2005. The Sewer Master Plan indicates that the City provides sewer service throughout the City, approximately 14,680 acres, and to a limited area outside the City limits, approximately 6 acres. Approximately 2,000 acres in the City drain to other serving entities or currently produce no sewage.

The City's sewer system consists of approximately 300 miles of gravity sewer, four pump stations, 1.4 miles of force mains, and 4,600 manholes. The one known siphon in the City's system is

[6] https://www.pomonaca.gov/home/showpublisheddocument/536/637457868354570000, *accessed November 20, 2021.*
[7] https://www.lacsd.org/services/wastewater-sewage/facilities/pomona-water-reclamation-plant, *accessed November 20, 2021.*
[8] https://www.pomonaca.gov/home/showpublisheddocument/542/637457870725430000, *accessed November 20, 2021.*

located at 4200 West Valley Boulevard and was installed in the early 1960s to convey wastewater across the San Jose Wash.

Solid Waste

The City of Pomona Utility Services Department provides trash, recycling, and special pickup services for single-family residences, duplexes, triplexes, and some fourplexes. Franchise commercial waste haulers provide trash and recycling service for most fourplexes, all apartments with five or more units, as well as all commercial, governmental, and industrial facilities. Solid waste is transported to transfer stations for sorting and shipping to landfills; no transfer stations serving Pomona are located in the City.

Electricity

Southern California Edison Company is the primary distribution provider for electricity in the City. The power received by the City's residents is produced at the various generation plants located throughout the region. Upon leaving the plant, electricity is distributed to individual users via local distributing stations, located within and around the City. The four substations and two primary transmission lines in Pomona are considered critical facilities.

Natural Gas

Currently, Southern California Gas Company maintains transmission and distribution lines throughout the City. Most lines operate at a medium pressure of approximately 30 to 60 pounds per square inch (psi), except for those located in the industrial areas that require higher pressures.

3.5 VULNERABLE POPULATIONS AND FACILITIES

Local hazards will not equally affect all areas and populations of Pomona. Identifying the vulnerable populations and facilities in the City will help to avert damage and prepare the City to provide extra assistance to those who will need it. Facilities that support vulnerable populations are described below and depicted geographically in **Map 3-1**. Facilities that have particular vulnerabilities to specific hazards are discussed in further detail in the relevant hazard chapters (**Chapters 4 to 9**).

SCHOOLS AND DAY CARE CENTERS

Children are the primary vulnerable group in Pomona. Minimizing damage to schools and daycare facilities will help ensure their safety during a local hazard event. Preparing schools for local hazards not only helps prevent harm from coming to the children of Pomona; the schools can

also be used as critical facilities following a local hazard event. During and after times of crisis, schools can be utilized to serve as mass care facilities and important centers of information and communication.

Public Schools

The Pomona Unified School District (PUSD) operates 41 schools within the City, which are mapped on **Map 3-1**. Two of PUSD's schools are located in Diamond Bar and, thus, serves a portion of that City's population. There are currently 21 elementary schools (grades K-6), 5 K-8 schools, 4 middle schools, 8 high schools (grades 9-12), and 3 other schools within the PUSD. Approximately 24,062 students attend PUSD schools, and the district is one of Pomona's largest employers.[9]

Private Schools

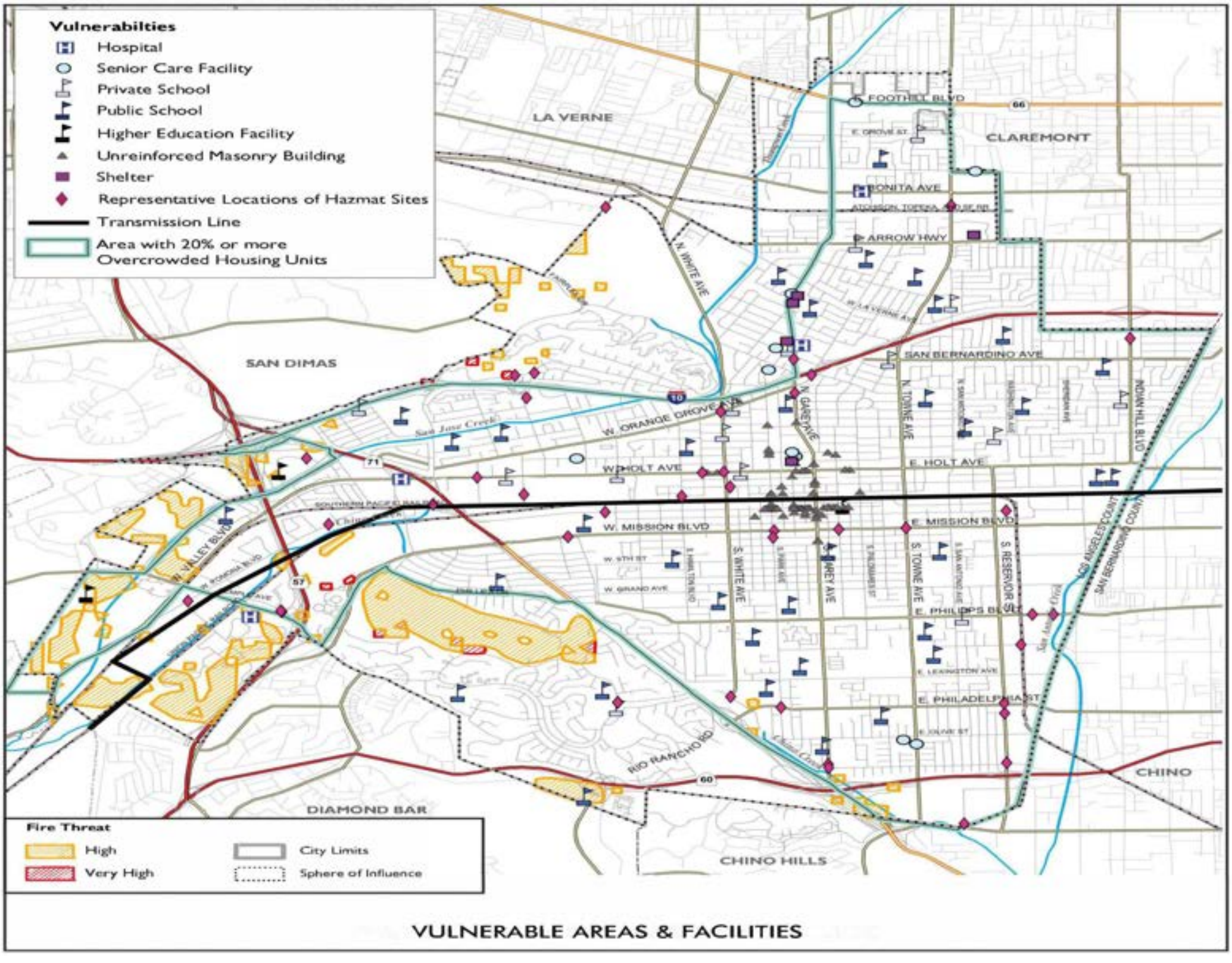
The City of Pomona has a number of private schools, including but not limited to St. Joseph Elementary School, Pomona Catholic Middle School and High School, American Christian Academy, and City of Knowledge. Locations of some of the larger private schools are depicted in **Map 3-1**.

Childcare Centers

There are 41 commercial day care providers in Pomona, which are considered greater vulnerabilities due to the larger number of children present at their facilities.[10] The locations of the commercial childcare centers are mapped in **Map 3-1**.

[9] *https://proudtobe.pusd.org/apps/pages/Facts, accessed August 28, 2021.*
[10] *https://www.ccld.dss.ca.gov/carefacilitysearch/Search/ChildCare, accessed September 21, 2021.*

Map 3-1: Vulnerable Facilities Map



Universities

There are several institutions providing higher education in Pomona. The largest of these is the California State Polytechnic University (Cal Poly Pomona). This University is located adjacent to the City's western border, mostly in unincorporated lands, but owns some land within city limits. Cal Poly Pomona employs more than 2,675 people and has an approximate enrollment of 27,915 graduate and undergraduate students.

Western University of Health Sciences (Western U) is located in downtown Pomona. Its main campus is at 309 E. 2nd Street. Western U opened a secondary campus in Oregon in 2017. At its Pomona campus, the University employs roughly 1,100 people and current enrollment is approximately 3,800 students.[11]

RECREATION AND COMMUNITY CENTERS

Approximately 25% of Pomona's population is younger than 18 years of age.[12] There are several recreation and community centers in the City that help to provide services to its young residents. These facilities also provide important services to seniors as well. Especially during after-school hours, these centers can become crowded with youth. The City operates community centers at six of its parks, as well as the Pomona Boys and Girls Club. There is also a YMCA in Pomona, which has served the community since 1884. The original YMCA building, completed in 1922, is also listed in the National Register of Historic Places and Pomona's Local Landmark Register. The facility was closed in 2012 and the existing building is currently approved for redevelopment.

SENIOR CARE FACILITIES

In addition to the care available at hospital facilities, seven senior care centers are located in Pomona. The residents of these facilities may require additional medical attention, transportation assistance, emergency housing, or other assistance following a local hazard event. Most senior fare facilities in Pomona are located north of Holt Avenue, and several are clustered along the Garey Avenue corridor.

HOSPITALS

Hospital facilities house large numbers of vulnerable patients who may need additional assistance in the event of an emergency. All of the hospitals in Pomona, including PVHMC, are considered assets with vulnerabilities. In addition, there are two other hospitals that serve as specialized treatment centers in Pomona: Casa Colina Hospital for Rehabilitative Medicine and Behavioral Health Services (BHS) - American Recovery Center. Information on PVHMC is provided in **Section 3-4**; Critical Facilities, and information about the remaining two hospitals is supplied

[11] https://www.westernu.edu/publicaffairs/news/fact-sheet/, *accessed August 28, 2021.*
[12] https://www.census.gov/quickfacts/fact/dashboard/pomonacitycalifornia/AGE295219, *accessed September 4, 2021.*

below.

Casa Colina Hospital for Rehabilitative Medicine

Casa Colina Hospital is an acute and sub-acute care hospital providing medical rehabilitation services. The hospital serves children and adults who have been disabled by spinal cord injury, brain injury, stroke, chronic lung disease, back injury, chronic pain, orthopedic conditions, neurological and neuromuscular disorders, developmental disorders, and other illnesses or injuries. The facility is located at 255 East Bonita Avenue and has 64 beds, a staff of 184 physicians, and 27 full-time staff nurses.

BHS - American Recovery Center

Behavioral Health Services is a not-for profit community-based healthcare organization providing medical services, substance abuse, mental health, drug-free transitional living, housing for women with HIV, and prevention services in Los Angeles County. BHS operates 21 locations, covering the South Bay, East Los Angeles, the San Gabriel Valley, and the metropolitan areas of LA County.[13] BHS – American Recovery Center located at 2180 Valley Boulevard in Pomona, provides 10 – 14 day medically assisted detox services with 24-hour medical supervision, 3 – 9 months intensive outpatient services, and 3 – 6 months inpatient services, depending on the client's needs.

SHELTERS

There are four shelters and transitional living facilities in Pomona identified by the City's department of Community Services. Such group living quarters are considered vulnerabilities because of their concentrations of people with special needs and limited resources. The potential for loss of life is much higher in the event of structural failure/building collapse. In addition, due to the limited financial resources of the inhabitants in these shelters, the residents may require special post-disaster assistance, in particular relocation assistance.

HAZARDOUS MATERIALS

Following a local hazard event, hazardous materials could potentially harm Pomona residents by exposing them to chemicals that may be poisonous, irritating, suffocating, or cause burns. The severity of hazardous materials impacts depends on many factors such as amount of chemical released, location, and rate and direction of dispersion. Identifying vulnerable toxic sites and preventing hazardous materials spills before they occur is fundamental to mitigating the myriad unpredictable impacts that such spills may have on the community.

Over 200 sites with exposed hazardous materials are located within the City of Pomona. These sites include leaking underground storage tanks (LUSTs), leaking underground fuel tanks (LUFT), and other hazardous materials sites that are listed by the California Department of Toxic

[13] *https://www.bhs-inc.org/, accessed December 8, 2021.*

Substances Control (DTSC). In order to address the primary hazardous waste vulnerabilities most efficiently, only the most acutely hazardous materials were mapped in **Map 3-1**. There is one location listed as a Federal Superfund site by the Environmental Protection Agency (EPA), under the Superfund Amendments and Reauthorization Act (SARA), Title III, and one Hazardous Waste and Substances (Cortese List) Site.[14] Of the many hazardous materials sites in the City, these represent the greatest threat to human and environmental health in the City if released.

In addition to stationary hazardous materials sites, hazardous material that is enroute to other locations via truck or train may also be present in Pomona at any given time. Restrictions placed on transporters of hazardous materials include the avoidance of heavily populated areas, unless no other satisfactory route exists, limitations on access to bridges and tunnels, and a one-mile-wide zone limitation along freeways for access to fuel and services. Railroad regulations stipulate that explosive materials are controlled within the train, but there are no controls regarding train routes. The only restriction is that potential flammable or explosive materials cannot be any closer than six rail cars from the train locomotive. This exposes neighborhoods near railway tracks in Pomona to potential hazards due to rail car derailment and hazardous spills.

UTILITIES

Critical facilities of the utility systems in Pomona are discussed in the previous section, but it is important to note that there are specific vulnerabilities associated with them as well. Undergrounded utilities may be subject to rupture during an earthquake, creating the potential for fire or releasing hazardous chemicals. Additionally, strong winds are capable of downing tree branches that can fall on power lines, and fires can damage aboveground utility lines. Depending on the event, impacts can remain localized or affect the entire City. Specific utility vulnerabilities are discussed further in the relevant hazard chapters, when appropriate (see **Chapters 4 to 9**).

VULNERABLE DEVELOPMENT PATTERNS

Overcrowded Communities

The U.S. Census collects information about the density and level of crowding in housing units. A unit is considered overcrowded if it has more than one occupant per room. The area of the City with 20 percent or more of housing units that are overcrowded, per census tract, is displayed in **Map 3-1**. Areas with a large percent of overcrowded units may experience greater impact during local hazard events due to their higher population densities. Because overcrowding is closely correlated with lower income levels and housing values, it is reasonable to assume that overcrowded neighborhoods may contain greater numbers of deteriorated buildings prone to damage than in other parts of the City. Emergency responders should be prepared to spend relatively greater amounts of time in the overcrowded neighborhoods when responding to the effects of a major disaster. Furthermore, there may be a need for higher levels of post-disaster assistance, such as short-term housing.

[14] https://www.epa.gov/superfund/search-superfund-sites-where-you-live, *accessed December 2021.*

Unreinforced Masonry (URM) Buildings

Unreinforced masonry buildings (URMs) are structures that are particularly vulnerable to damage during an earthquake. These buildings generally constructed prior to 1933 predate modern earthquake-resistant design standards. URM buildings are made of brick and have not been reinforced with strengthening steel bars in the structure. The walls of these buildings are more likely to disconnect from the foundation and fall during ground shaking, creating debris hazards and sometimes total collapse of the structure. URM buildings in Pomona are depicted on **Map 3-1**. Many of these were damaged in the 2008 Chino Earthquake.

Historic Properties

First incorporated in 1888 as the fifth city in Los Angeles County, Pomona has an impressive inventory of historic properties. It includes eight properties listed on the National Register of Historic Places, five properties designated as California Historic Landmarks, and twenty-six properties designated locally on Pomona's Landmark Register, as well as two historic districts. There are several additional districts with potential historic significance and more than 500 potential historic properties under consideration for local, state, or national historic designation.

Many of these structures are particularly vulnerable to damage from hazards due to their age, construction methods, and materials. Many historic buildings were heavily damaged in the last major hazard event to affect Pomona, the Whittier Narrows earthquake. The City of Pomona owns three of the most historic properties, which date back to the first modern settlement of the site that later became Pomona.

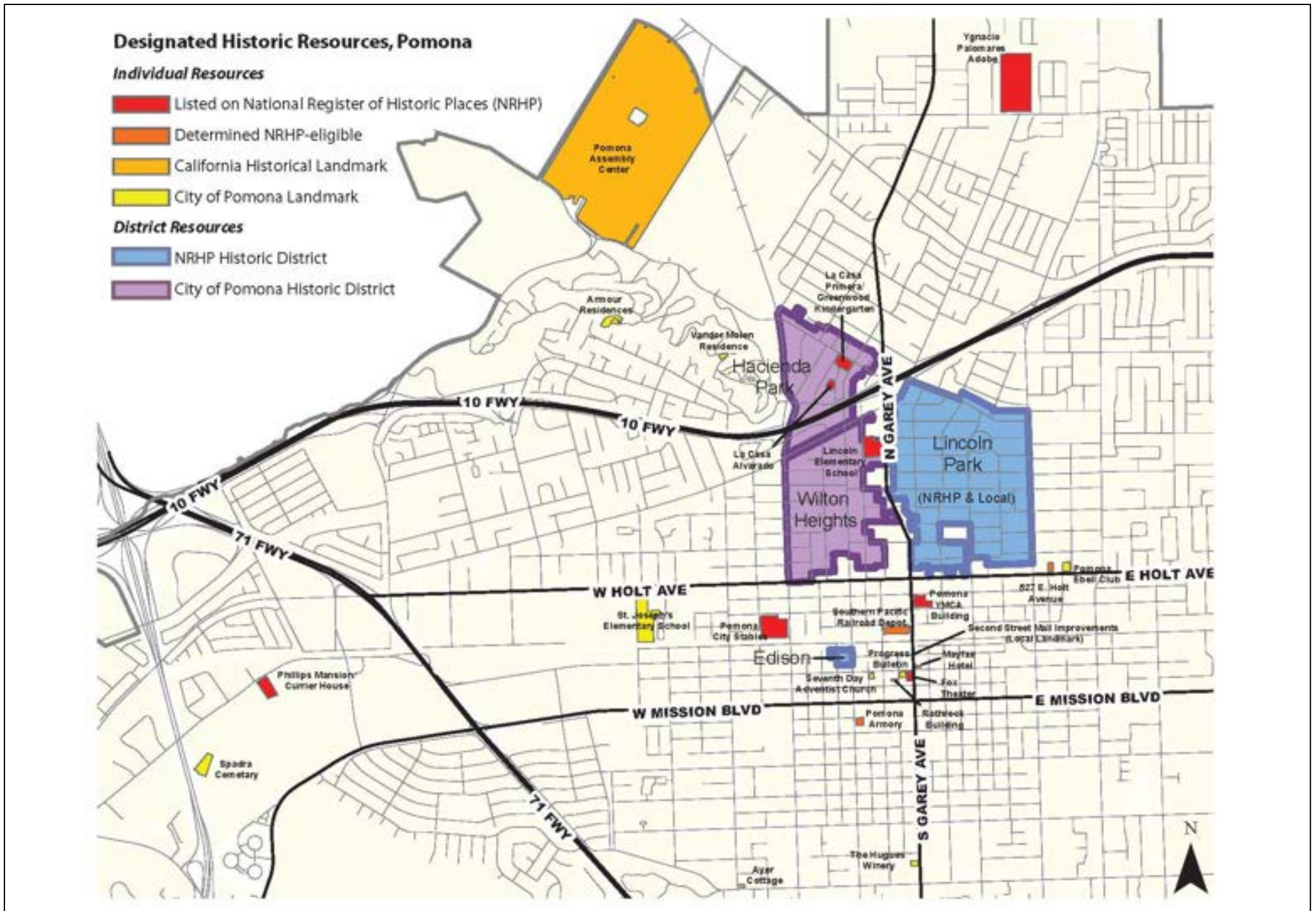
Pre-1976 Structures

Seismic safety standards were first incorporated into Pomona's building code in 1976. Due to the considerable age of the City, however, the majority of the structures were constructed before such standards were in place. Historic structures and areas have been mapped in **Map 3-2**. The distribution of structures by age clearly displays the evolution of Pomona: the oldest buildings are clustered downtown - including the URM buildings discussed above - and development radiates outward over time from this core. In the vast majority of cases, pre-1976 buildings are not required to conform to seismic safety requirements and have an elevated risk to damage due to earthquake. Older structures are also more prone to wind damage.

Hazard-Specific Land Uses and Construction

In addition to other types of vulnerable development patterns discussed in this section, there are specific land uses and construction types that are more susceptible to particular local hazards. For example, soft-story and tilt-up construction tends to be more vulnerable to ground shaking. Development in the urban/wildland interface increases the risk of damage due to wildfire. These types of hazard-specific developments are discussed in further detail in **Chapters 4 - 9.**

Map 3-2: Designated Historic Resources



Source: Historic Resources Technical Report
July 18, 2012 - Architectural Resources Group

Designated Historic Resources

3.6 RISK IDENTIFICATION AND VULNERABILITIES SUMMARY

Identified risks and vulnerabilities associated with local hazards in Pomona are summarized below. **Chapters 4 - 9** document the analyses yielding these conclusions.

EARTHQUAKE

The following risks and vulnerabilities associated with ground shaking, liquefaction, and earthquake-induced landslides have been prioritized for mitigation actions:

- Many of the buildings in Pomona were constructed before seismic safety standards were implemented in 1976; this includes a majority of the facilities that house emergency services and government operations.
- There are dozens of unreinforced masonry buildings, which are well-known for their poor ability to withstand earthquakes. They are especially prone to collapse and pose substantial risks to life and property.
- Historic properties are more prone to sustain damage and collapse during an earthquake. Historic structures and areas in Pomona are mapped in **Map 3-2**.
- Much of the utility infrastructure in Pomona is aging and will need maintenance or replacement. Critical components of the utility systems, such as water reservoirs, have partial seismic safety features in place but completion of retrofit programs has been deferred.
- Targeted transportation corridors have been identified as crucial and vulnerable lifelines, essential for emergency vehicle traffic. Collapse of underpasses or train derailment would impair proper provision of emergency services in the aftermath of an earthquake.
- Particular neighborhoods in Pomona have an elevated vulnerability to earthquake hazards due to the age of the structures, or due to a high percentage of overcrowding. Often these characteristics coincide; damage in these neighborhoods is expected to be relatively greater than the rest of the City and will require concomitant emergency response.

LANDSLIDE

The following risks and vulnerabilities associated with landslides have been prioritized for mitigation.

- Residential developments in the hills of Pomona are at risk to landslide. Not only are they built on areas that are historically prone to landslides due to topography and soil conditions, but road development, grading, excavation and other forms of development. (*4 homes were lost in a 2006 landslide in South Pomona*.)

WILDFIRE

The following risks and vulnerabilities associated with wildfire have been prioritized for mitigation.

- Development in the urban/wildland interface is especially vulnerable to wildfire damage. Communities such as Phillips Ranch and Ganesha Hills were built in these areas and require more stringent wildfire mitigation measures. Aging infrastructure in the City is vulnerable to damage from earthquake, which could affect the City' s water supply in the event of a wildfire.

FLOODING

The following risks and vulnerabilities associated with flooding have been prioritized for mitigation:

- A small number of locations in areas associated with flooding have been prioritized for mitigation. Pomona is prone to flooding due to storm drain deficiencies. The flooding that occurs seasonally at the railroad underpasses is of particular concern, as it has the potential to block routes that are considered key transportation lifelines. The City could be subject to flooding in the event of dam failure. However, due to the distance of the City from the reservoirs, the minimal amount of water that is stored at the relevant impoundments, and the very low probability of occurrence, this risk is not considered to have significant potential for widespread community impacts.

WINDSTORM

The following risks and vulnerabilities associated with windstorm have been prioritized for mitigation:

- Santa Ana winds which occur from October through March and can damage or dislodge roofs and topple trees and power lines. These windstorms can affect the entire city, but potential damage is not widespread and there are no high risks to critical facilities or city infrastructure. (*A windstorm in 2011 affected communities west of Pomona. Power was out for over a week due to tree damage.*)

PANDEMIC/INFECTIOUS DISEASE

The following risks and vulnerabilities associated with pandemics and infectious disease have been prioritized for mitigation:

- Protecting vulnerable populations has been prioritized. The health and safety of the public is threatened by pandemics/infectious diseases. As evidenced by the COVID-19 pandemic

all communities, regardless of density may be severely impacted by a pandemic/infectious disease. However, an emerging infectious disease or novel virus may impact have a greater impact on overcrowded communities, particularly where there is a clustering of older residential structures that may not meet current building standards and may not have adequate ventilation. It is also likely, and also evidenced by COVID-19, that vulnerable communities are particularly susceptible to more severe impacts of emerging infectious diseases and novel viruses due to higher comorbidity rates, and pollution exposure, as well as socio-economic challenges that may prevent a person from working from home or taking time off and isolating, if necessary. (*As of December 9, 2021, there were approximately 514 deaths attributed to COVID-19 in Pomona*).

- Protecting business operations in the City has been prioritized. Business and economic impacts may be severe. The City must be able to be flexible with the business community and provide easy pathways toward allowing businesses to continue operating while protecting the health and welfare of the public.

3.7 POTENTIAL FINANCIAL LOSSES

POTENTIAL DAMAGE ESTIMATES

A comprehensive assessment of the potential risks faced by a community involves understanding financial vulnerabilities in addition to prospects for injury, life loss, and property damage. Estimates of financial costs help to underscore the cost effectiveness of emergency preparedness and hazard mitigation actions and improvements. In addition, cost estimates calculated for separate hazard scenarios-earthquake, flooding, landslide, etc.- provide a quantitative tool for comparing hazard effects and prioritizing mitigation.

For each hazard where data were available, cost estimates of potential damage have been calculated. The primary tool available to estimate the potential losses of local hazard events is the GIS-based software HAZUS. A HAZUS scenario was constructed to estimate losses due to earthquake damage in the City; total potential losses exceeded 2.5 billion dollars. While these estimates are highly hypothetical, they nevertheless provide a sense of the magnitude of potential financial impacts.

4 Earthquakes

4.1 INTRODUCTION

California is home to the most intense and greatest number of earthquakes in the contiguous United States: of the 20 largest earthquakes in the contiguous United States, 10 have occurred in California[15]. The State also ranks number one in the nation in the amount of damage caused by earthquakes, in large part due to its high population and degree of urbanization[16]. The City of Pomona is no exception to the rest of the State, and the threat posed by an earthquake is considered the most significant hazard facing Pomona. This chapter provides information about earthquake hazards in Pomona, beginning with an overview of historic events and the probability of future earthquakes in Southern California, and then identifies specific areas of hazards and risks within the city.

4.2 HAZARD PROFILE

HAZARD DESCRIPTION

Generally defined, an earthquake is an abrupt release of accumulated energy in the form of seismic waves when movement occurs along a fault. The City of Pomona lies in a seismically active region of Southern California, with several major active faults in the area, including the San Andreas, Sierra Madre, and Whittier - Elsinore fault zones. However, in addition to these known faults, movement along buried blind thrust faults that have no obvious surface features can also occur.

Faulting and Seismicity

Earth scientists use the angle of the fault with respect to the surface (known as the dip) and the direction of slip along the fault to classify faults. Faults that move along the direction of the dip plane are dip-slip faults and described as either normal or reverse, depending on their motion. Faults that move horizontally are known as strike-slip faults and are classified as either right-lateral or left-lateral. Faults that show both dip-slip and strike-slip motion are known as oblique-slip faults. The types of faults are described below and illustrated in **Figure 4-1**:

- *Normal Fault.* A dip-slip fault in which the block above the fault has moved downward relative to the block below. This type of faulting occurs in response to extension and is often observed in the Western United States Basin and Range Province and along oceanic

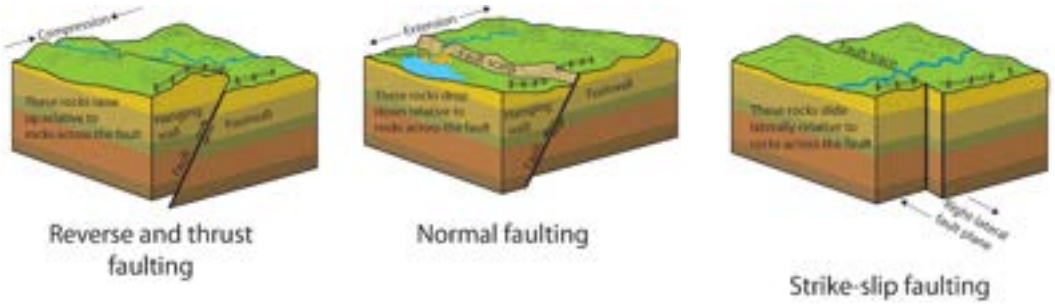
[15] *National Earthquake Information Center website: http://neic.usgs.gov/neis/eqlists/lOmaps_usa.html, accessed September 13, 2021.*
[16] *USGS Earthquake Hazards Program website: http://earthquake.usgs.gov/faq/hist.html#5, accessed September 13, 2021..*

ridge systems.

- *Thrust Fault*. A dip-slip fault in which the upper block, above the fault plane, moves up and over the lower block. This type of faulting is common in areas of compression, such as regions where one plate is being subducted under another. When the dip angle is shallow, a reverse fault is often described as a thrust fault.

- *Strike-Slip Fault*. A fault on which the two blocks slide past one another. A left lateral strike-slip fault is one on which the displacement of the far block is to the left when viewed from either side. A right lateral strike slip fault is one on which the displacement of the far block is to the right when viewed from either side. The San Andreas Fault is an example of a right lateral strike-slip fault[17].

Figure 4-1: Types of Faults



4.2.1 HISTORIC EVENTS

Although damaging earthquakes have occurred numerous times in Southern California, the City of Pomona has never declared a state of emergency due to an earthquake. During the 1987 Whittier Narrows earthquake, several historic buildings were damaged, but the city did not sustain any deaths or serious injuries. Relatively speaking, Pomona has been able to avoid many of the dire effects of earthquakes experienced by other Southern California communities. However, the risk to the city from an earthquake is still great given the history of earthquakes in the Southern California and the probability of future occurrence in the region. In order to examine the earthquake threat to Pomona, it is useful to review experiences of other Southern California cities in profiling earthquake hazards.

Historical earthquake records can generally be divided into records of the pre-instrumental period and the instrumental period. In the absence of the instrumentation the detection of earthquakes is based on the observations and witness reports and is dependent upon population density and distribution. Since California was sparsely populated in the 1800's the detection of pre-instrumental earthquakes is relatively difficult. However, two very large earthquakes, the

[17] *USGS Earthquake Hazards Program website: http: //earthquake.usgs.gov/faq/plates.html, accessed June 30, 2004*

Fort Tejon in 1857 (7.9) and the Owens Valley in 1872 (7.6) are evidence of the tremendously damaging potential of earthquakes in Southern California. In more recent times, four earthquakes greater than 7.0 have occurred in Southern California: 7.5 in Kern County (1952) 7.3 in Landers (1992), 7.1 in Hector Mine (1999), and 7.1 in Ridgecrest (2019). **Table 4-1** lists historic earthquakes in Southern California of a magnitude 5.0 or greater.

Table 4-1: Southern California Earthquakes with Magnitude 5.0 or Greater

Southern California Region Earthquakes with a Magnitude 5.0 or Greater			
1769	Los Angeles Basin – M6.0	1941	Carpinteria – M5.5
1800	San Diego Region – M6.3	1952	Kern County – M7.5
1812	Wrightwood – M7.5	1954	W. of Wheeler Ridge – M6.4
1812	Santa Barbara Channel – M7.2	1971	San Fernando – M6.6
1827	Los Angeles Region – M5.5	1973	Point Mugu – M5.3
1855	Los Angeles Region – M6.0	1986	North Palm Springs – M5.6
1857	Fort Tejon – M7.9	1987	Whittier Narrows – M5.9
1858	San Bernardino Region – M6.0	1992	Landers – M7.3
1862	San Diego Region – M5.9	1992	Big Bear – M6.5
1892	San Jacinto or Elsinore Fault – M6.3	1994	Northridge – M6.7
1893	Pico Canyon – M5.7	1999	Hector Mine – M7.1
1894	Lytle Creek Region – M6.0	2008	Chino Hills – M5.4
1894	E. of San Diego – M5.7	2014	La Habra – M5.1
1899	Lytle Creek Region – M5.7	2014	South Napa – M6.0
1899	San Jacinto and Hemet – M6.6	2016	Borrego Springs – M5.2
1907	San Bernardino Region – M5.3	2019	Ridgecrest (1 of 2) – M6.4
1910	Glen Ivy Hot Springs – M5.5	2019	Ridgecrest (2 of 2) – M7.1
1916	Tejon Pass Region – M6.1	2019-2020	Ridgecrest aftershocks; At least six occurrences greater than M5.0, less than M6.0
1918	San Jacinto – M6.8	2020	Lone Pine – M5.8
1923	San Bernardino Region – M6.3	2021	Calipatria/Brawley – M5.3
1925	Santa Barbara – M6.8	2021	Little Antelope Valley – M6.0
1933	Long Beach – M6.4		

Sources: Southern California Earthquake Data Center (SCEDC) Website, accessed November 2021.
Southern California Seismic Network Website, accessed November 2021

The damage from these four large earthquakes was limited because they occurred in areas that were sparsely populated. The seismic risk is much more severe today in areas of widespread growth throughout Southern California, with the population at risk in the millions, rather than a few hundred or a few thousand persons. This is evidenced by the Northridge earthquake of 1994.

Although the magnitude of the earthquake (6.7) was smaller than the aforementioned events, the Northridge earthquake became the costliest earthquake in California history. 57 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. The total cost of the damage caused by the Northridge earthquake approached 50 billion dollars.

4.2.2 HAZARD LOCATION AND EXTENT

There are numerous faults in the Los Angeles area that are categorized as active, potentially active, and inactive. A fault is classified as active if it has either moved during the Holocene time (during the last 11,000 years) or is included in an Alquist Priolo Earthquake Fault zone (as established by the California Division of Mines and Geology). A fault is classified as potentially active if it has experienced movement within Quaternary time (during the last 1.8 million years). Faults that have not moved in the last 1.8 million years are generally considered inactive. Surface displacement can be recognized by the existence of cliffs in alluvium, terraces, offset stream courses, fault troughs and saddles, the alignment of depressions, sag ponds, and the existence of steep mountain fronts.

REGIONAL FAULTS

Earthquakes from several active and potentially active faults in the Southern California region could affect future development within the City of Pomona, although no known regional faults directly traverse the city. It should be noted, however, that the Northridge Earthquake occurred on a previously undetected active fault, and more faults may exist than are discussed here. The nearest identified regional faults are summarized below and presented in **Map 4-1**.

Active Faults

- *San Andreas Fault Zone.* Located approximately 20 miles to the northeast of the City, this fault zone extends from the Gulf of California northward to the Cape Mendocino area where it continues northward along the ocean floor. The length of the fault and its active seismic history indicates that it has a very high potential for large scale movement in the near future (magnitude 8.0+ on Richter scale) and should be considered important in land use planning for most cities in California.

Map 4-1: Seismic Hazards

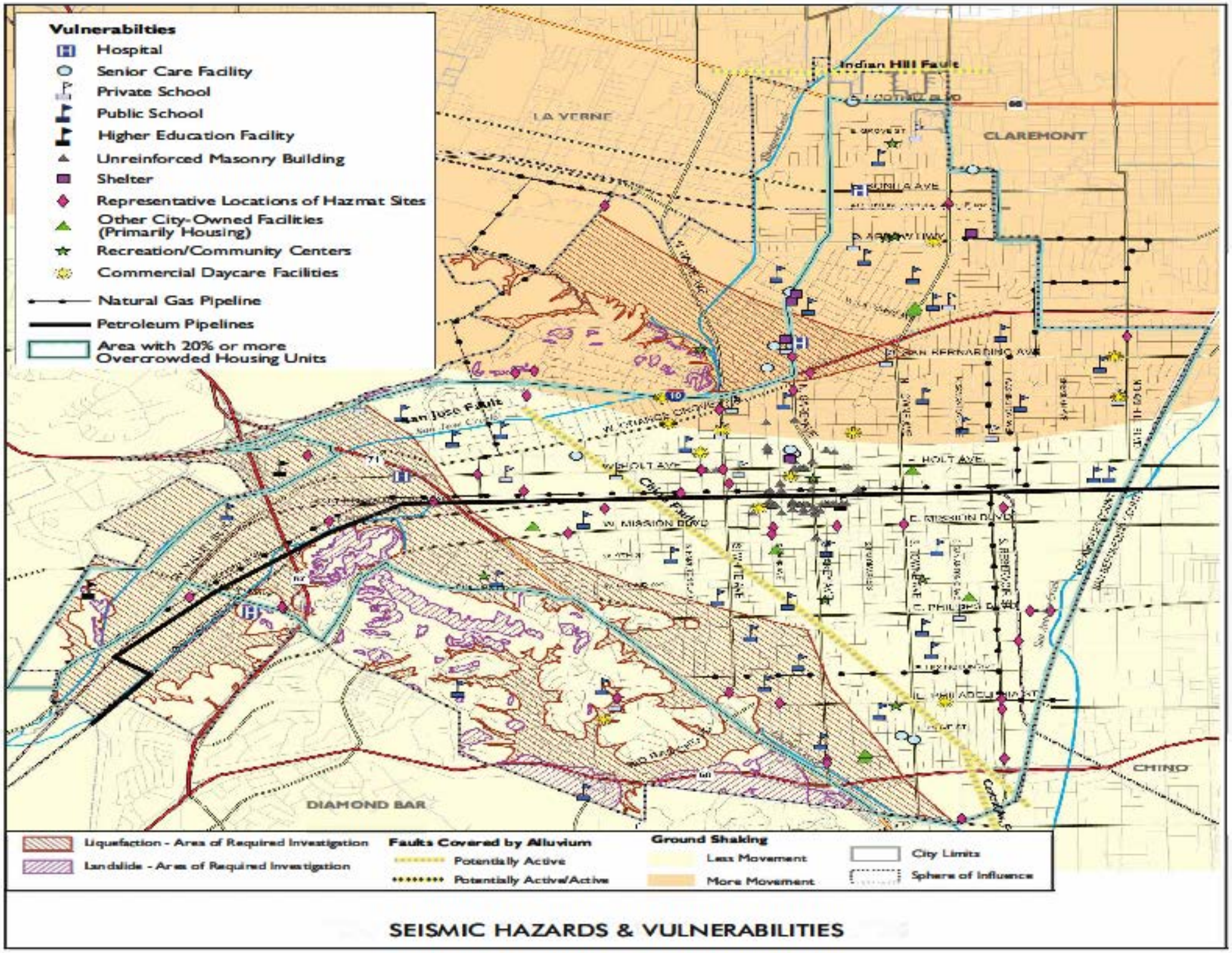
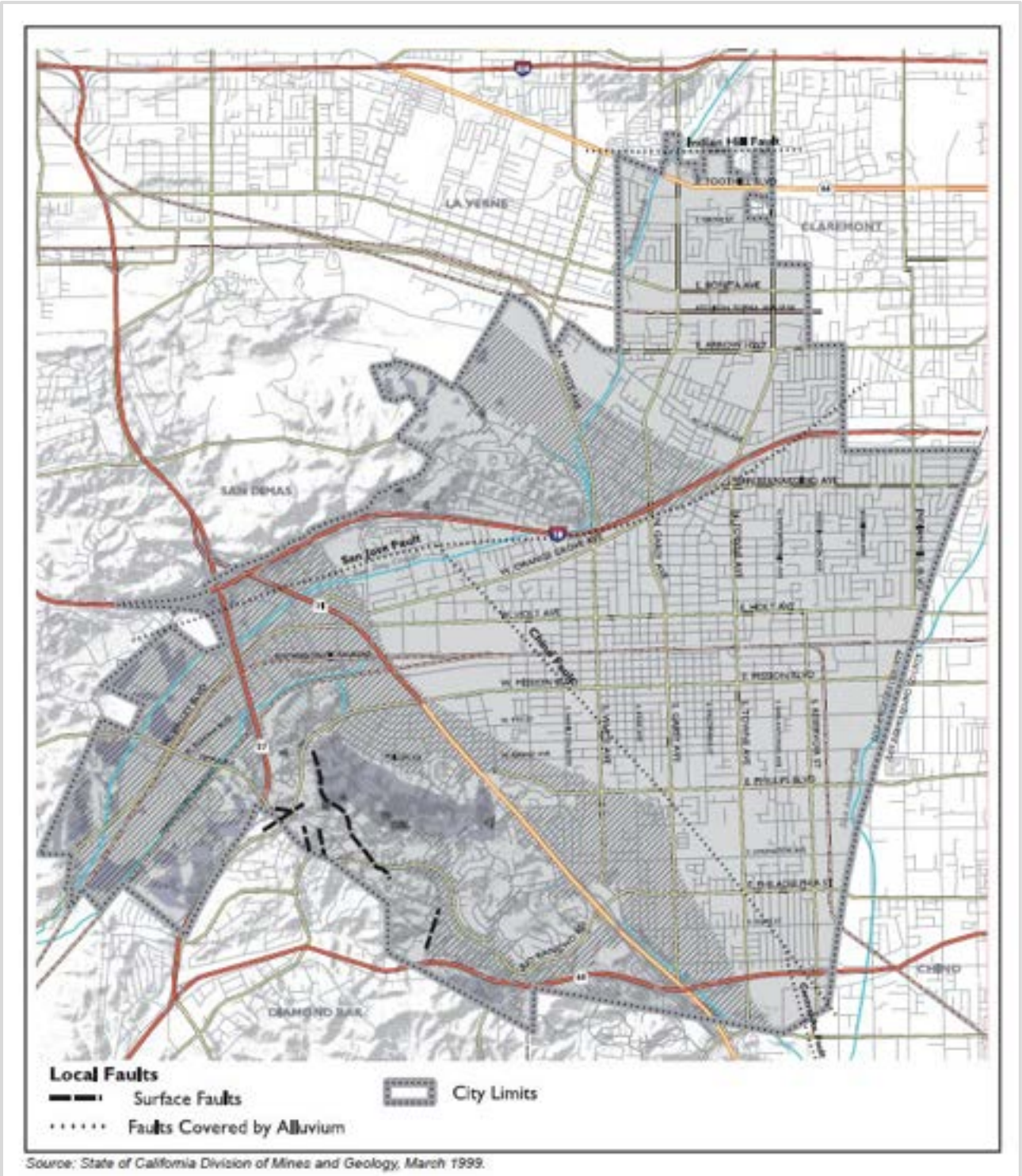


Figure 4-2: Regional Faults



Source: State of California Division of Mines and Geology, March 1999.

- *Sierra Madre Fault System.* Located approximately one mile north of the City, at the base of the San Gabriel Mountains, this fault system forms a prominent 50-mile long east-west

structural zone on the south side of the San Gabriel Mountains. It consists of a complex system of dips and slips and has a left lateral reverse component. The Sierra Madre fault system has been responsible for uplift of the San Gabriel Mountains by faulting in response to tectonic compression. In many places, the faults have placed basement bedrock over alluvium where they dip northerly below the steep topographic front of the San Gabriel Mountains.

- *Whittier-Elsinore Fault Zone.* This fault zone is located along the southern base of the Puente Hills, approximately 9 miles to the southwest of the City. This northwest-trending fault trends from Whittier Narrows southeast across the Santa Ana River, past Lake Elsinore into western Imperial County and then into Mexico. This fault zone has the expected maximum capability of a magnitude 6.6 earthquake.

- *San Fernando Fault Zone.* This fault is located approximately 30 miles northwest of the City. Generally, fault segments are east-west trending thrust faults with associated left lateral movement.

- *Newport-Inglewood Fault Zone.* Located approximately 35 miles southwest of the City this fault zone could generate a 7.0 magnitude earthquake within the next 50 to 100 years.

- *Norwalk Fault.* Located approximately 25-miles southwest of the City, this fault strikes 65 to 85 degrees to the northwest and dips steeply to the northeast. The fault is approximately 16 miles long and has an accurate trace between Buena Park and Tustin. Micro seismic activity along the Norwalk Fault is high and it may be capable of generating a magnitude 6.3 earthquake.

Potentially Active Faults

- *San Gabriel Fault.* Labeled as potentially active, this fault is located approximately 20 miles northwest of the City. This fault extends from Frazier Park to Mount Baldy Village, a distance of approximately 84 miles. Because of its length and its ancestral relationship with the San Andreas Fault System, its potential future activity must be realized. Due to the length of its surface trace, the San Gabriel Fault is believed capable of generating a magnitude 7.8 earthquake.

- *Verdugo Fault.* Located approximately 22 miles west of the City, this potentially active fault bounds the south flank of the Verdugo Mountains and appears to merge with the Eagle Rock-San Rafael Fault System in the vicinity of the Verdugo Wash. Low magnitude earthquakes (less than 3.0) which have been attributed to activity along the Verdugo Fault are occasionally recorded in the Burbank-Glendale area. No direct evidence of ground displacement has been observed as associated with these low magnitude earthquakes.

The Verdugo Fault has a high potential for future activity and is capable of generating a magnitude 6.4 earthquake.

- *Santa Monica Fault.* This fault is located approximately 25 miles west of the City. No detailed information is available on the exact location of this southwest-northeast trending fault at the ground surface (fault trace), or on its geometric orientation. This fault the Malibu Coast Fault, and the Raymond Fault belong to one large fault system. Classified as a potentially active fault, this fault could generate a moderate seismic event (magnitude 6.6).

Local Faults

In addition to the regional faults, there are several local faults located within the city that are considered potentially active. No recent seismic activity has been recorded along these faults in the last 10,000 years. However, a major earthquake occurring along with any of these faults would be capable of generating seismic hazards and strong ground shaking effects within the City. These local faults include the San Jose, Indian Hill, Chino, and Central Avenue Faults. Of the local faults, the probability of earthquake activity is considered the highest along the San Jose Fault, with possible ground rupture. Neither the Indian Hills Fault, Chino Fault, nor the Central Avenue Fault have high probability of seismic activity, and their precise locations are currently not well defined. None of the local faults have been placed in an Alquist-Priolo Special Studies Zone. Thus, no fault rupture hazard is anticipated along the fault traces that pass through the City. These local faults are further described below and are illustrated in **Figure 4-2.**

- *San Jose Fault.* This fault is classified as potentially active and is located in the San Jose Hills, on the western edge of the City. The fault is approximately 13 kilometers long and runs in a northeast/southwest direction approximately parallel to the I-10 freeway. The fault has an 80-to-85-degree upward dip and has a revere movement with the north side up. The fault displaces upper Miocene sedimentary and volcanic rocks as much as 2,700 feet vertically, with a 100 - meter vertical offset in older subsurface alluvium. Some geologists consider this fault as seismically active and the origin of the L.A. County earthquakes in 1988 and 1990.

- *Indian Hill Fault.* This fault is located along the northern section of the city and runs an east/west direction for approximately 9 kilometers. It is believed to be a single strand and is considered potentially active. This fault serves as a barrier to groundwater movement and offsets soils of Late Pleistocene age which is the reason it is considered potentially active.

- *Chino Fault.* Considered to be a part of the Whittier-Elsinore fault system, this fault borders the Puente Hills to the northeast and is buried along most of its length. It is

approximately 28 kilometers long from the Santa Ana Mountains to the City of Pomona in a northwest-southeast direction, as it joins the San Jose Fault, near the I-10. Based on geomorphic evidence, it does not appear to have as great a potential for seismic activity. The fault has an estimated slip rate of 0.2 mm/year. Some geologists have questioned whether the Chino fault is in reality an earthquake fault, since recent evidence indicates that it is not a fault but the contact point between bedrock and less consolidated alluvium, although in 2008 the Chino Fault had a quake that damaged Pomona City Hall and a number of URM buildings in the downtown area.

- *Central Avenue Fault*. Considered a potentially active fault and located in the City of Chino, this fault extends into the southern portion of the City of Pomona. This fault is approximately 8 kilometers long and believed to be a single strand that is subparallel to the Chino fault. The fault exhibits displacement on Quaternary and Holocene age deposits but has no surface expression.

EARTHQUAKE EXTENT

Magnitude

A seismograph can determine the size or magnitude (Richter Magnitude Scale) of an earthquake by measuring the movement of the Earth's surface and recording the radiating earthquake waves. Each whole number magnitude increase represents a ten-fold increase in the up and down motion recorded by the seismograph. An M = 6 earthquake causes 10 times the recorded motion of an M = 5 and 100 times the motion of an M = 4 earthquake. The magnitude is then used to calculate the amount of energy released by the earthquake. Each whole number increase in magnitude corresponds to an energy increase of about 32 times the lower magnitude value. An M = 6 earthquake releases about 30 times the energy of a M = 5 and nearly 1,000 times the energy of a M = 4 earthquake.

As earthquakes increase in size, the ground motion no longer increases in a way directly related to the increased size of the earthquake. A different method of determining magnitude based on the number of factors, such as area of slip, is used to calculate the size of earthquakes generally greater than M = 8.

Intensity

Earthquake size may also be determined using a subjective scale of observed damage. This method was used before the installation of seismographs and before the development of the Richter Magnitude Scale. An example is the Modified Mercalli Intensity (MMI) Scale first published in 1931. The intensity of damage observed at a specific building depends upon a number of factors, such as the earthquake's magnitude, distance from the fault generating the earthquake, type of geologic materials underneath the building, type of building construction, age of construction, and other attributes. Over time the MMI scale has been modified to address

changes in building types. All these possible variations in damage result in a single earthquake being capable of producing intensities ranging from *not felt at a particular location* (MMI = I) to *causing catastrophic damage* (MMI = XII) at another place. Historical records generally list an earthquake's maximum observed intensity and the size of the area in which the earthquake was felt.

Table 4-2: Modified Mercalli vs. Richter Scale

Modified Mercalli vs. Richter Scale		
Category	**Modified Mercalli Description**	**Richter Scale**
I. Instrumental	Not felt	**2.5 – Generally not felt but recorded by seismograph**
II. Weak	Felt only a few people, especially on upper floors of tall buildings	
III. Slight	Felt by people lying down, seated on a land surface, or in the upper stories of tall buildings	**3.5 – Felt by many people**
IV. Moderate	Felt indoors by many, by few outside; dishes and windows rattle	
V. Rather Strong	Generally felt by everyone; sleeping people may be awakened; vibrations like train passing close to house	
VI. Strong	Trees and poles may sway, some damage from falling objects	**4.5 – Some local damage may occur**
VII. Very Strong	General alarm; walls and plaster crack; difficult to stand; noticed by people driving	
VIII. Destructive	Damage slight in specially designed structures; considerable in ordinary buildings with partial collapse; damage great in poorly built structures; damage to chimneys, factory stacks, columns, monuments, walls	**6.0 – Destructive earthquake**
IX. Violent	General panic; some houses collapse, pipes break; damage considerable in poorly designed structures; buildings shifted off of foundation	
X. Intense	Some well-built wooden structures destroyed,; most masonry and frame structures destroyed with foundation; obvious ground cracks; railroad tracks bent; some landslides on steep hillsides	**7.0 – Major earthquake**
XI. Extreme	Few buildings survive; bridges damaged or destroyed; all services interrupted (electrical, water, sewage, railroad, etc.); severe landslides	**8.0 and up – Great earthquakes**
XII. Catastrophic	Total destruction; objects thrown into the air; ground moves in waves or ripples; river courses and topography altered	

EARTHQUAKE HAZARDS

Several hazards can be produced by a single earthquake event. Ground shaking, landslides, and liquefaction are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake. A discussion of these hazards is presented below, and areas affected by each of these hazards are mapped in **Figure 4-2.**

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter.

Although the entire city is susceptible to damage from ground shaking, geological conditions can greatly influence the amount of shaking experienced throughout the City. The majority of Pomona is underlain by alluvial soils, transported from the San Gabriel Mountains the north, which are less resistant to shaking than other soil types. However, portions of the city situated on bedrock such as San Jose (Ganesha Hills) and Puente (Elephant Hill, Phillips Ranch) would likely experience less ground shaking and associated damage.

Landslides

Landslides are secondary earthquake hazards that can occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake.

The Northridge earthquake of 1994 provides an example of the serious and damaging effects of landslides. As a result of the magnitude 6.7 earthquake, more than 11,000 landslides occurred over an area of almost 400 square miles. The landslides destroyed dozens of homes, blocked roads, and damaged oil-field infrastructure. They indirectly caused deaths from Coccidioidomycosis (valley fever), the spore of which was released from the soil during landslide activity and blown towards populated coastal areas.[18]

Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes. In Pomona, the risk of damage due to landslides is confined to parts of Phillips Ranch and Ganesha Hills. These areas are delineated by the State of California Division of Mines and Geology and depicted in **Figure 4-2.** Although some of the susceptible areas have residential development, most of them are located in designated open space.

[18] *Highland. L.M. and R.L. Schuster, Significant Landslide Events in the United States. Accessed via website at: http://landslides.usgs.gov.html_tiles/pubs/report/Landslides_pass_508.pdf*

In the landslide-prone areas that are developed, the risk of a damaging flow is even greater. Although landslides are a natural geologic process in the hills around Pomona, residential developments in these areas exacerbate the risk of landslide hazards. Grading for road construction and development can increase slope steepness and contribute to the speed and severity of landslides. Grading and construction can also decrease the stability of a hill slope by adding weight to the top, removing support at the base of the slope, and increasing water content. Other human activities affecting landslides include excavation, drainage and groundwater alterations, and changes in vegetation.[19]

Liquefaction

The phenomenon of 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 structures. Pomona is one of many communities in Southern California that is built on an ancient river bottom and has sandy soil. In some cases, this ground may be subject to liquefaction, depending on the depth of the water table.

The California Geological Survey identifies and maps areas susceptible to liquefaction, based on groundwater levels and geologic materials. Pomona has 4,025 acres or 27 percent of the city area that fall within these zones and are susceptible to liquefaction. These areas generally occur at the base of the hills in the southern and western portions of the City. Liquefaction areas are presented in **Map 4-1.**

4.2.3 PROBABILITY OF FUTURE OCCURRENCE

The USGS estimates that within the next 30 years the probability is 99% that an earthquake measuring a magnitude of 6.7 or greater will occur in California[20]. It is impossible to predict exactly where it will take place; however, there are fault segments that are considered more likely than others to produce such an earthquake. Along the Earth's plate boundaries, segments exist where no large earthquakes have occurred for long intervals of time. Scientists term these segments "seismic gaps" and, in general, have been successful in forecasting the time when some of the seismic gaps will produce large earthquakes.

Geologic studies show that over the past 1,400 to 1,500 years large earthquakes have occurred at about 150-year intervals on the southern San Andreas fault. As the last large earthquake on the southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades. However, the San Andreas fault is just one of

[19] *Planning For Natural Hazards: The Oregon Technical Resource Guide. Department of Land Conservation and Development. 2000: Chapter 5.*

[20] *https://www.usgs.gov/congressional-statement/statement-dr-david-applegate-senior-advisor-earthquake-and-geologic-hazards. September 15, 2021*

many faults capable of producing large earthquakes in the region.

Although the science of earthquakes is not exact, these predictions are persuasive reminders of the constant risk of earthquakes to Southern California communities. The focus of the research on estimating the timeframe and location of earthquakes is itself a reminder that when discussing earthquakes, it is not a matter of "if" one will occur, it is a matter of when and where.

4.3 VULNERABILITY ASSESSMENT

OVERVIEW

The effects of earthquakes span a large area, and large earthquakes occurring in many parts of the Southern California region would probably be felt throughout the region. However, the degree to which earthquakes are felt, and the damage associated with them may vary. At risk from earthquake damage are large stocks of old buildings and bridges; many high tech and hazardous materials facilities; extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; and other critical facilities and private property located in the City. Identifying these vulnerabilities and estimating potential losses that could occur due to an earthquake event are crucial steps in the process of formulating effective, efficient mitigation measures.

4.3.1 IDENTIFYING VULNERABILITIES

Chapter 3: Risk Assessment details the various types of critical and vulnerable facilities within Pomona. Each of these types of facilities is vulnerable to damage by an earthquake and its associated hazards of ground shaking, landslides, and liquefaction. Of these facilities, the Technical Advisory Committee, drawing upon available scientific research, building structural information, historical experience, and community knowledge, identified specific vulnerabilities to target in the earthquake hazard mitigation process. The following sections identify those facilities that are considered the most vulnerable portions of the city to earthquake damage and are specific targets of earthquake mitigation action items.

EMERGENCY SERVICES

As previously discussed in **Chapter 3: Risk Assessment**, much of Pomona was built before seismic safety standards were implemented in 1976. Many of the City's critical facilities were also built before 1976 and could be more vulnerable to the hazards associated with earthquakes. Detailed studies will have to be conducted in order to determine which, if any, of the City's buildings have the potential to suffer serious damage during an earthquake. However, identifying those that predate seismic safety standards will help to prioritize the inventory process.

- Emergency Government Operations. All the buildings that are designated as facilities for use during an emergency were likely built before 1976. The only location identified in the City's EOP that is not inside a potentially vulnerable structure is located in the west parking lot of City Hall. However, this location lacks many of the amenities of an operational building, such as shelter, electricity, restrooms, and additional assets that would be significant in the operation of the Emergency Operation Center (EOC).

- Police and Fire Facilities. The majority of police and fire facilities in Pomona were built before 1976. These building include the main building, jail, and property/evidence storage structures of the Pomona Police Department and five of the City's eight fire stations (an additional fire station was built in 1952, however it has been retrofitted to conform to 2003 building code standards). These five stations have not been seismically retrofitted, although they were evaluated in 2003 for seismic safety and each rated “better than average" for seismic performance relative to buildings of the same general type (see **Table 4-3**).

Table 4-3: Fire Stations Built Before 1976

FIRE STATION	YEAR BUILT	CONSTRUCTION MATERIALS	RETROFIT?
181	Unknown Pre-1976	Reinforced Concrete Reinforced Masonry	No
182	1963	Reinforced Masonry	No
183	1952	Reinforced Masonry	Yes (2003)
184	Unknown: (1959-1974)	Tilt-Up precast concrete	No
185	1962	Reinforced Masonry	No
186	1963	Reinforced Masonry	No

181 was closed in 2012, but the Division VIII Office, Battalion Chiefs, Fire Department Offices, and other department sections remained. In January 2020, the Division VIII Office and Fire Prevention Office were relocated from Pomona to Diamond Bar

HOSPITALS

Both of the major medical facilities in Pomona house vulnerable patient populations who would require substantial assistance in the event of damage. Additionally, damage that incapacitated Pomona Valley Hospital Medical Center, which is the only provider of emergency medical services in the City, would detrimentally affect Pomona's ability to care for people injured in a large earthquake.

In accordance with the Hospital Seismic Safety Act - which requires that all hospitals be in compliance with seismic standards to allow the hospital to be capable of reasonably providing continued operations following a major seismic event by January 1, 2030 - a number of structures

at these facilities are being retrofitted or replaced. Further details on each of the facilities is provided below:

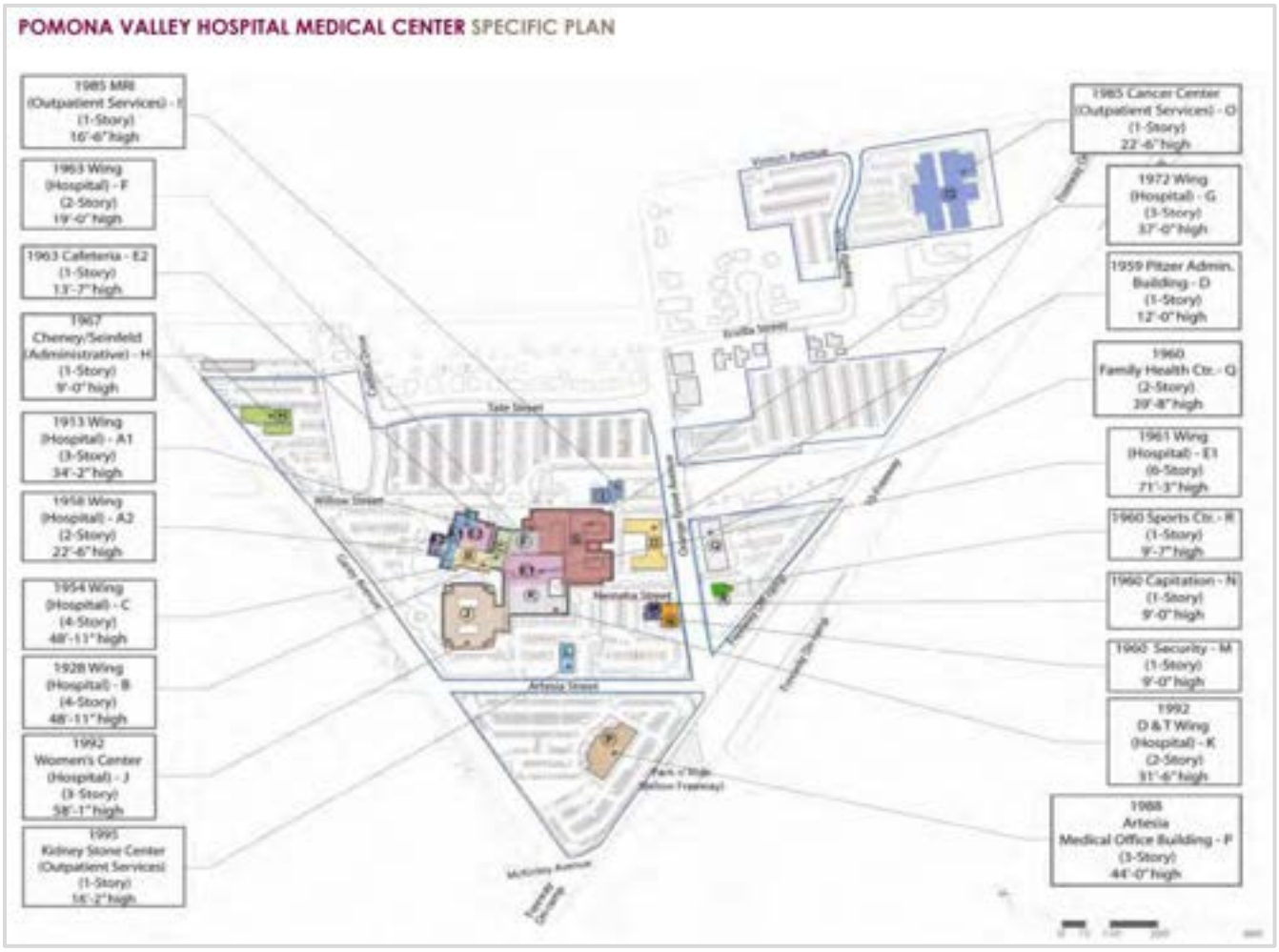
- *Pomona Valley Hospital Medical Center*. The hospital celebrated its 100-year anniversary in 2003. The buildings that make up the Pomona Valley Community Hospital Medical Center (PVHMC) were constructed over several decades. The hospital building has likewise been constructed in stages, beginning with the original 1913 structure (currently Wing A of the hospital building).

  A Specific Plan to address seismic safety issues and an expansion of the hospital facilities for the PVHMC was adopted in 2008 and most recently amended in 2016. The plan is intended to guide the future growth and operation of PVHMC and to meet Senate Bill 1953 (SB 1953) hospital seismic safety requirements. Under the Specific Plan, PVHMC would be expanded in three phases. Phase 1 would include the construction of a new 56,000 sf outpatient pavilion and a 138,000-sf inpatient wing and lobby addition to the main hospital building. Phase 2 would add a 54,000-outpatient pavilion and a 123,000-sf hospital inpatient wing. Phase 3 would add an additional 129,000 sf of inpatient facilities in a new wing and add a 400-stall parking structure. The PVHMC core campus will have expanded to include 1,012,314-sf of combined new and existing facilities, a net increase of 267,299-sf. Demolition of 232,701-sf of existing facilities is also proposed, the majority of which would occur at the end of Phase 3. Implementation of the Specific Plan would occur over a period of years, extending until 2030[21].

  In communication with hospital staff, it was conveyed that, as of May 2021, the Woman's Center and Diagnostics and Testing buildings are structurally compliant, and that several buildings were in plan check with OSHPD for material sampling, a precursor to plan check submittals for structural upgrades.

[21] https://ceqanet.opr.ca.gov/2008031111/6. *Accessed September 15, 2021*

Figure 4-3: PVHMC Specific Plan



- *Casa Colina Center for Rehabilitative Medicine*. Casa Colina completed construction of a new hospital facility which started receiving patients in 2005. This facility was built in full compliance with the safety standards of SB 1953. All outpatient facilities were built from 2001 to the present.

Although these private facilities are privately owned and will be responsible for mitigating hazards on their property, increased preparedness and communication between them and City officials will help to coordinate emergency efforts in the event of an earthquake.

UTILITIES

Each of the components of Pomona's utility systems contribute to its overall operation and efficiency. However, some components are more critical to system operation and have been targeted as specific vulnerabilities to be addressed during earthquake mitigation.

Water

Maintaining water quality and distribution are crucially important during and after hazard events. The following critical components of the City's water service system are vulnerable to earthquake damage:

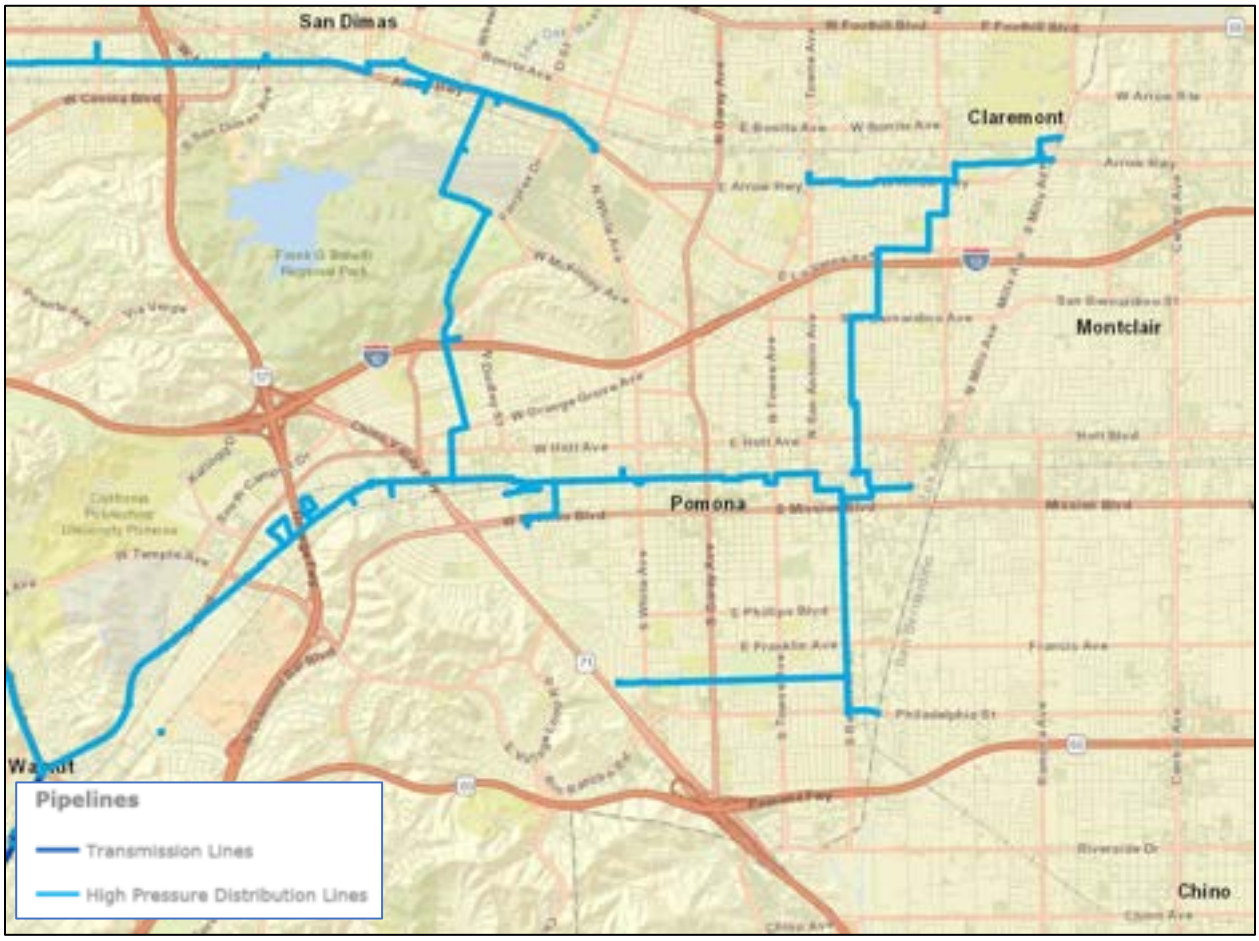
- *Water Reservoirs*. Six of the City's 22 water reservoirs have been upgraded with seismic safety valves which would shut off the reservoir in the event of a rupture, preventing drainage of the reservoir and potential flooding. Currently, there are no plans to upgrade the remaining 16.
- *Groundwater Wells.* A majority of Pomona's water supply is provided by local groundwater wells. The structural stability of these facilities is unknown and would have to be evaluated through further technical studies to assess vulnerability to ground shaking and liquefaction. None of the ground water wells are located in areas subject to earthquake-induced landslides. If a well(s) were to experience earthquake-related damage, local water supplies would only be incrementally affected, and the overall community impact is considered low.
- *Water Treatment.* The City's Anion Exchange Plant removes nitrates from the water supply for a significant portion of the City.[22] Failure of this plant has the potential to substantially limit potable water supply. The structural stability of the plant is unknown; however, it was completed in 1992, and is assumed to have a high level of resistance to ground shaking due to its modern construction standards.

Underground Utility Lines

Underground utilities - such as natural gas and petroleum - may be subject to rupture during an earthquake, creating the potential for fire or the release of hazardous chemicals. Specifically, the two petroleum pipelines and seven primary natural gas distribution pipelines could pose significant fire and hazardous materials risks if ruptured. In addition to these main lines, the aging underground utility network in Pomona may experience any number of ruptures along its lines, resulting in localized service disruptions or release of materials.

[22] *https://www.envirogen.com/wp-content/uploads/2019/07/Pomona-Case_Study-ETI-1.pdf, accessed November 6, 2021.*

Figure 4-4: Gas Transmission Lines in Los Angeles County



SCHOOLS

In increasing Pomona's resilience to earthquakes, prioritizing the safety of the community's children is a primary concern. The many schools within the City house thousands of students during school hours and are considered a substantial vulnerability. Many of Pomona's children attend school at private facilities, but the vast majority attend school at one of Pomona Unified School District's (PUSD) facilities.

RECREATION AND COMMUNITY CENTERS

In addition to schools, recreation and community centers also house a large number of children. As discussed in **Chapter 3: Risk Assessment**, the City of Pomona operates six community centers. Three of these facilities were constructed before seismic safety codes were established. Currently, no other information about the potential structural vulnerability to earthquake damage is available, and further studies would need to be conducted to determine their level of vulnerability. Two of the community centers are also in areas subject to liquefaction. The Ganesha Park Community Center, one of the City's most popular recreation facilities, is also the

most potentially vulnerable. It was constructed in 1950 and located in an area subject to strong ground shaking, liquefaction, and earthquake induced landslides.

UNREINFORCED MASONRY BUILDINGS

The City of Pomona has dozens of unreinforced masonry (URM) buildings. These buildings are especially vulnerable to damage and collapse during earthquakes. Their potential for collapse poses hazards to life and property loss. Also, many of these buildings are valuable assets to the City's rich historical heritage. The URM buildings in Pomona are clustered in the oldest and most central portion of the city, largely located along 2nd Street in Downtown.

VULNERABLE DEVELOPMENT PATTERNS

In general, the size of Pomona households is large. 26% of Pomona households are considered “large” which is defined as five or more individuals per household. The average household size is 2019 was 3.77, which is almost one person per household more than the Los Angeles County average. Many of these households are also considered “overcrowded”, which is defined as more than one person living per room within a house. 31.3% of households are considered overcrowded, compared to 21.8% in Los Angeles County.

Central Pomona has a number of vulnerable development characteristics that could potentially result in more damage due to an earthquake when compared to other areas of the City. In general, census tracts with the highest percentages of overcrowded units are located in central Pomona; these high densities increase the potential number of people per neighborhood who would be impacted by an earthquake. Additionally, many of these overcrowded areas are located in neighborhoods with older structures, which pre-date seismic safety standards. Finally, large numbers of multi-family units are located in Central Pomona, of which a number are likely “soft story” apartment buildings. This type of construction is characterized by multi-storied structures that have an opening on the ground floor, such as a garage, that is less sturdy than the floors above it. These buildings are particularly vulnerable to earthquake damage, as the weakened first story may sustain damage, shift, or collapse. The combination of these development characteristics creates an area of the city with elevated susceptibility to the hazardous effects of earthquakes.

RAILROADS

The Union Pacific Railroad (UPR) line that is located in the center of the city is a primary east-west freight corridor. Trains on the tracks also carry passengers on a much more limited basis. An earthquake that caused derailment, damage to the tracks by liquefaction, or obstruction on the tracks due to landslides would be a tremendous vulnerability to the city. A train present on the tracks would seriously hamper the ability of emergency vehicles to traverse the city, especially if the crucial underpasses at Garey, White, and Towne Avenues were blocked. Although the possibility of a train derailment in the city seems remote, it was just such an event that

prompted the construction of Pomona Valley Hospital Medical Center, as mentioned in **Chapter 1 Introduction**. The City does not have jurisdiction over the UPR tracks; hazard planning and mitigation is the responsibility of the Union Pacific Railroad. However, the City can coordinate with UPR on mitigation planning and work to maximize local emergency facility resiliency to help reduce risks associated with the railroad.

4.3.2 ESTIMATING POTENTIAL LOSSES

Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time[23]. Factors included in assessing earthquake risk include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure, and disaster preparedness of the region. This type of analysis can generate estimates of the damage to the region due to an earthquake event in a specific location. FEMA's software program, HAZUS, uses mathematical formulas and information about building stock, local geology and the location and size of potential earthquakes, economic data, and other information to estimate losses from a potential earthquake[24].

HAZUS EARTHQUAKE SCENARIO

To perform the risk analysis for this LHMP, a magnitude 6.7 earthquake was simulated using HAZUS. The earthquake scenario was based on ground shaking data derived from USGS shake map scenario on the San Jose Fault. It is impossible to exactly predict the circumstances of the next earthquake to affect the city, and the data provided by the HAZUS simulation will surely differ from the actual losses experienced due to such an event. However, the use of HAZUS allows the City to view reasonable potential losses from a modeled earthquake and make appropriate mitigation and emergency preparedness decisions.

It is noteworthy that this model assumes that the entire city is underlain by alluvial site conditions; although the majority of the city is located on an alluvial fan, portions on the western boundaries are underlain by bed rock, which is more resistant to ground shaking. Additionally, the secondary earthquake hazards of fire and debris generation were simulated in this scenario. A discussion of the risks associated with these hazards follows the summary of HAZUS results.

Structural Damage

In this HAZUS scenario, 12.5 percent of buildings in Pomona experienced at least moderate damage. Approximately 900 structures were completely destroyed, and the vast majority of these were residential uses. Overall, buildings that sustained the most damage were manufactured housing or structures with wood construction.

[23] *Burby. R. (Ed.) Cooperating with Nature: Confronting Natural Hazard s with Land Use Planning for Sustainable Communities (1998). Washington D.C. Joseph Henry Press.*
[24] *FEMA HAZUS http://www.fema.gov/hazus (May 2021).*

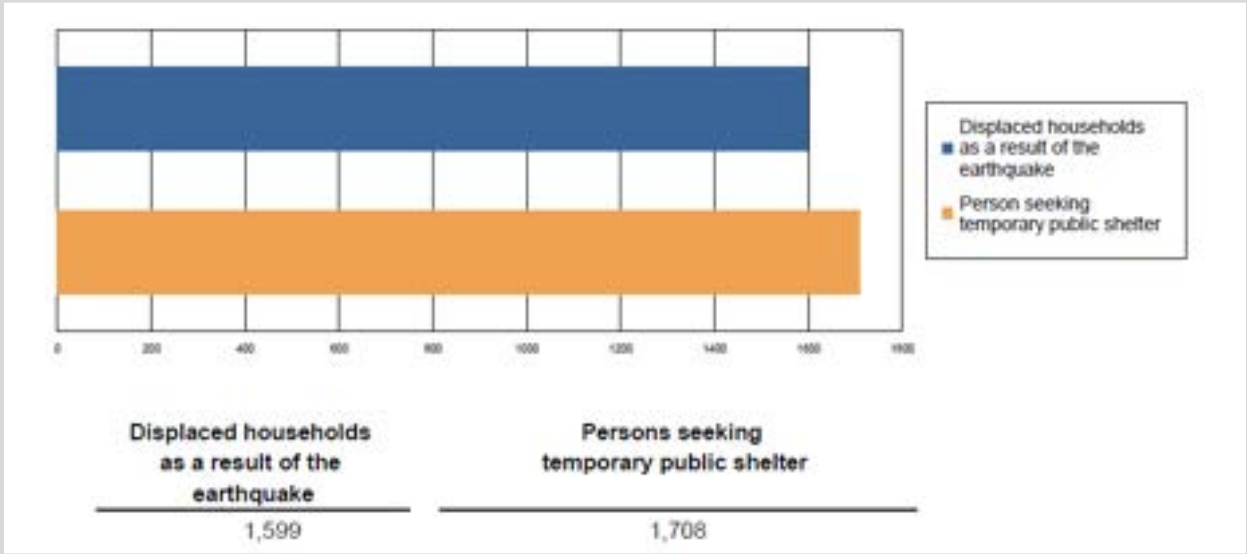
Table 4-4: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.29	0.08	10.73	0.08	11.87	0.14	6.10	0.29	3.01	0.33
Commercial	238.98	2.77	360.95	2.73	566.60	6.67	365.56	17.39	162.91	18.10
Education	18.99	0.22	24.78	0.19	27.19	0.32	13.38	0.64	4.66	0.52
Government	2.37	0.03	3.52	0.03	5.50	0.06	3.86	0.18	1.75	0.19
Industrial	60.74	0.71	93.99	0.71	164.91	1.94	113.17	5.38	54.19	6.02
Other Residential	452.06	5.25	768.73	5.81	925.52	10.90	798.66	38.00	447.04	49.68
Religion	24.94	0.29	35.75	0.27	44.41	0.52	27.58	1.31	12.32	1.37
Single Family	7807.31	90.65	11926.17	90.18	6745.15	79.44	773.37	36.80	213.99	23.78
Total	8,613		13,225		8,491		2,102		900	

Displaced Persons

This model estimated that the earthquake displaced 1,599 households. Although some of these people would be able to seek shelter with relatives, friends, or alternative means, approximately 1,708 people would require accommodation in temporary public shelters.

Table 4-5: Displaced Households/Persons Seeking Short Term Public Shelter



Casualties

Casualty estimates are provided for three times of day, 2:00 AM, 2:00 PM, and 5:00 PM. Casualties are highest during the 2:00 PM scenario with approximately 1,550 people were injured or killed during this earthquake scenario. The majority of these casualties, roughly 1,110, were due to minor injuries requiring medical attention but not hospitalization. The remaining number includes more serious injuries requiring hospitalization and approximately 90 deaths.

Table 4-6: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	10.80	3.03	0.49	0.96
	Commuting	0.03	0.07	0.08	0.02
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	20.04	5.48	0.83	1.64
	Other-Residential	221.85	53.32	6.12	11.60
	Single Family	165.69	24.49	1.21	2.10
	Total	**418**	**86**	**9**	**16**
2 PM	Commercial	640.02	179.18	28.92	56.83
	Commuting	0.30	0.59	0.76	0.16
	Educational	239.88	65.88	10.65	20.83
	Hotels	0.00	0.00	0.00	0.00
	Industrial	147.67	40.29	6.16	11.99
	Other-Residential	48.69	11.75	1.39	2.56
	Single Family	35.87	5.36	0.31	0.46
	Total	**1,112**	**303**	**48**	**93**
6 PM	Commercial	458.61	126.01	20.72	40.22
	Commuting	4.67	9.41	12.03	2.52
	Educational	23.33	6.44	1.05	2.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	92.29	25.18	3.85	7.49
	Other-Residential	83.22	20.07	2.37	4.38
	Single Family	64.27	9.60	0.56	0.81
	Total	**726**	**199**	**41**	**57**

Fire Damage

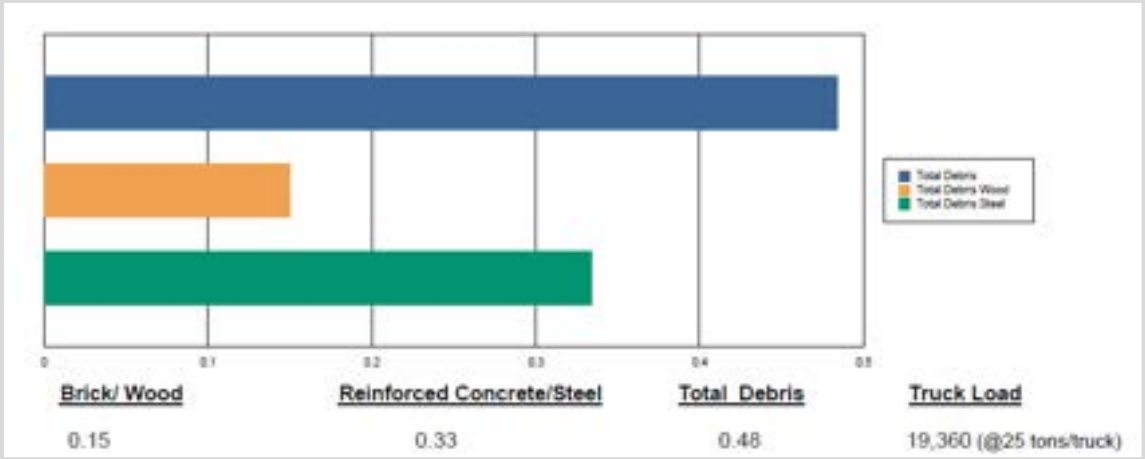
Fires often occur following an earthquake, due to downed power lines, ruptured fuel lines or other flammable materials becoming exposed and ignited. In the wake of an earthquake water may not be immediately available or may be available in limited quantities. Additionally, emergency personnel may be stretched thin and responding to other emergency situations. These factors increase the hazard that such fires pose to Pomona. This HAZUS scenario modeled

three fire ignitions in the City, resulting in the displacement of an additional 506 people and thirty-one million dollars of property damage.

Debris

The HAZUS-MH scenario produced an estimated 484,000 tons of debris. Following an earthquake, the City would need to devote resources to cleaning up brick, glass, wood, steel or concrete building elements, office and home contents, and other materials. This challenge includes disposing of or recycling the waste in compliance with the regulations of AB 939: The Integrated Waste Management Act. For these reasons, developing a strong debris management strategy is essential in post-disaster recovery.

Table 4-7: Earthquake Debris (millions of tons)

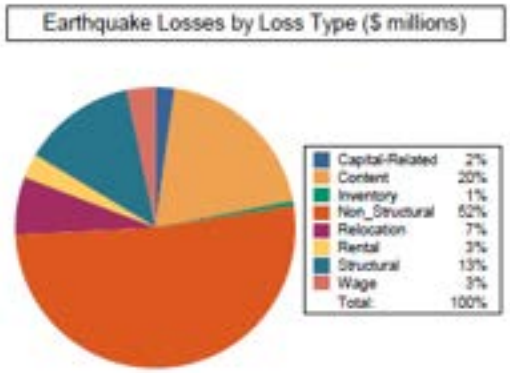


Direct Economic Impacts

The total estimated economic loss to the City in this scenario was 2.5 billion dollars. The economic losses calculated by HAZUS-MH include both income (wage, capital related, rental, relocation) and capital (structural, non-structural, content, inventory) losses incurred by earthquake damage, as well as damage to transportation and utility lifelines. The majority of losses were caused by building-related losses, which totaled 2.3 billion dollars. Within that category, residential losses comprise the largest portion 51% primarily due to damage of single-family homes.

The aforementioned economic impacts do not include indirect impacts, long-term changes that occur as a result of direct impacts. Such impacts include losses due to business closures, employment changes, loss of tourism revenues, changes in sales tax revenues, or other long-term consequences of earthquake damage.

Table 4-8: Building Related Economic Loss Estimates (millions of dollars)



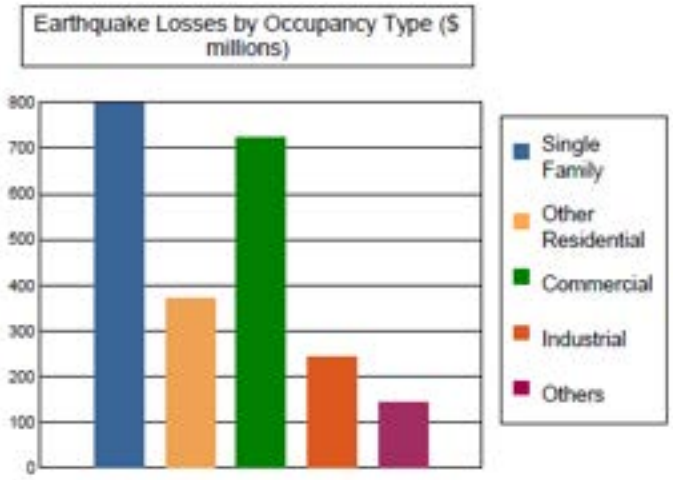


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.0557	66.2671	4.1600	3.4403	77.9231
	Capital-Related	0.0000	1.7220	47.3160	2.5948	1.3086	52.9414
	Rental	15.9428	17.0835	28.5176	1.5857	1.9733	65.1029
	Relocation	58.1384	14.7344	50.3301	7.3132	18.5282	149.0443
	Subtotal	**74.0812**	**37.5956**	**192.4308**	**15.6537**	**25.2504**	**345.0117**
Capital Stock Losses							
	Structural	96.9492	44.6101	105.5313	31.5851	16.9782	295.6539
	Non_Structural	480.5309	234.2282	284.3100	109.6361	67.8937	1,176.5989
	Content	147.7758	54.2318	137.6300	73.6736	32.4963	445.8075
	Inventory	0.0000	0.0000	4.2226	10.7916	0.0965	15.1107
	Subtotal	**725.2559**	**333.0701**	**531.6939**	**225.6864**	**117.4647**	**1933.1710**
	Total	**799.34**	**370.67**	**724.12**	**241.34**	**142.72**	**2278.18**

Additional Risk Analysis Factors

This HAZUS scenario did not model the potential effects of liquefaction or earthquake-induced landslides, which are important secondary hazards associated with earthquakes. Of the two hazards, liquefaction presents a more serious risk to the City. It covers a widespread area, unlike the localized hazard of landslides, and includes many important lifelines that could be damaged due to liquefaction. **Table 4-9**, below, lists the total structural assets that are located within these secondary earthquake hazards areas.

Table 4-9: Structures within Liquefaction and Landslide Zones

LAND USE	UNITS	STRUCTURE VALUE (IN MILLIONS)	ACRES	UNITS	STRUCTURE VALUE (IN MILLIONS)	ACRES
Low Density Residential	5437	402.3	924.3	144	24.1	328
Medium Density Residential	988	47.4	121.4	17	1.3	3.8
High Density Residential	595	19.8	21.1			
Automotive, Motel, & Service Commercial	129	12.4	33.6			
Retail Commercial & Shop Centers	28	46.0	109.6			
Office	15	38.8	38.4			
Light Industrial	65	127.7	243.7			
Heavy Industrial & Outdoor Storage	99	30.8	143.7			
Parks & Open Space	N/A	N/A	86.0	N/A		253.8
Education	3	0.1	509.7			N/A
Public, Civic & Institutional	4	120.1	718.4			
Vacant Land		N/A	61.1	N/A		
Total	**7,364**	**846.6**	**3,011.1**	**161**	**25.4**	**325.3**

4.3.3 CLIMATE CHANGE IMPACT

Scientists are currently studying the impacts of climate change on seismic activity. While increased temperatures are not linked to an increased risk of earthquake occurrence, scientists are currently studying the seismic consequences of water and how climate change may factor into such phenomena as drought[25]. Furthermore, climate change may amplify the secondary effects of earthquakes, including increasing temperatures which could intensify fire risks, or contribute to drought which in turn dries out vegetation and affects available water supply, which

[25] *Source: https://climate.nasa.gov/news/2926/can-climate-affect-earthquakes-or-are-the-connections-shaky/, accessed November 4, 2021*

could further constrain firefighting efforts during fires caused by an earthquake. Droughts exacerbated by climate change can also lead to subsidence, that could intensify damage resulting from an earthquake.

5 Landslides

5.1 INTRODUCTION

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year.[26] The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually.[27] Some landslides result in private property damage, while other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life. California has had a significant number of locations impacted by landslides, attributable to a variety of conditions present in the state: seismic activity, heavy seasonal participation, rapid development, and varied topography. Landslides resulting from these types of conditions are discussed in this chapter, while earthquakes-induced landslides are addressed in **Chapter 4 Earthquakes.**

5.2 HAZARD PROFILE

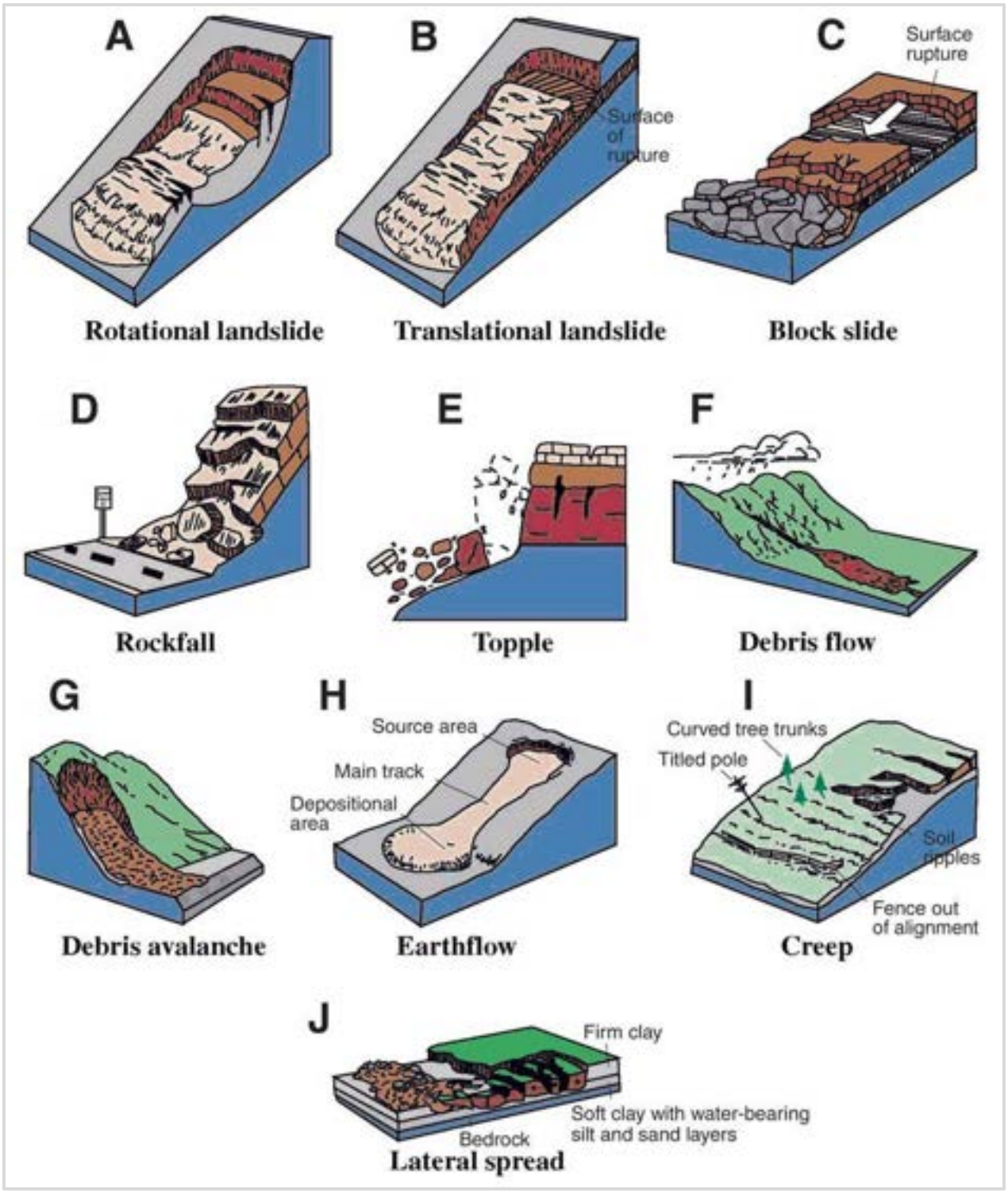
HAZARD DESCRIPTION

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides are a type of “mass wasting" which denotes any downslope movement of soil and rock under the direct influence of gravity. Failure of a slope occurs when the force that is pulling the slope downward (gravity) exceeds the strength of the earth materials that compose the slope. They can move slowly, (Millimeters per year) or quickly and disastrously, as is the case with debris flows.

The term "landslide" encompasses events such as rock falls, topples, slides, spreads, and flows. Landslides can be initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, disturbance and change of a slope by man-made construction activities, or any combination of these factors. Landslides can also occur underwater, causing tidal waves and damage to coastal areas. These landslides are called submarine landslides.[28]

[26] *https://www.usgs.gov/faqs/how-many-deaths-result-landslides-each-year?qt-news_science_products=0#qt-news_science_products, accessed November 2021*
[27] *Brabb, E.E., and B.L Harrod. (Eds) Landslides: Extent and Economic Significance. Proceedings of the 28th International Geological Congress Symposium on Landslides. (1989) Washington D.C., Rotterdam: Balkema.*
[28] *Landslide Hazards, U.S. Geological Survey Fact Sheet 0071-00, Version 1.0, U.S. Department of the Interior - U.S. Geological Survey, http://pubs.usgs.gov/fs/fs-007 l-00/*

Figure 5-1: Landslide Types



Source: https://www.nps.gov/articles/monitoring-slope-movements.htm, National Park Service webpage, accessed December 2021.

The size of a landslide usually depends on the geology and the initial cause of the landslide. Landslides vary greatly in their volume of rock and soil, the length, width, and depth of the area affected, frequency of occurrence, and speed of movement. Some characteristics that determine the type of landslide are slope of the hillside, moisture content, and the nature of the underlying materials. Landslides are given different names, depending on the type of failure and their composition and characteristics.

Landslides can be broken down into two categories: (I) rapidly moving-generally known as debris flows-and (2) slow moving. Rapidly moving debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides are at increased risk of serious injury. Due to their sluggish rate of movement, slow moving landslides typically do not result in loss of life but can cause widespread property damage over time.

Debris Flows

A debris flow - also known as a mud flow - is a semi-fluid mass of rock, earth, vegetation, and other materials that is saturated with water. This high percentage of water gives the debris flow a very rapid rate of movement down a slope. Although debris flows can travel down a hillside of speeds up to 200 miles per hour, speeds more commonly range 30 -50 miles per hour. Travel rates depend on the slope angle, water content, and type of earth and debris in the flow.

This high rate of speed makes debris flows extremely dangerous to people and property in its path. Earthquakes often trigger debris flows, as discussed in **Chapter 4 Earthquakes**. These flows are also initiated by heavy, usually sustained, periods of rainfall, but sometimes can happen as a result of short bursts of concentrated rainfall in susceptible areas. Burned areas charred by wildfires are particularly susceptible to debris flows, given certain soil characteristics and slope conditions.[29]

Slow Moving Landslides

Landslides move in contact with the underlying surface. These movements include rotational slides where sliding material moves along a curved surface, and translational slides where movement occurs along a flat surface. These types of slides are generally slow moving and can be deep. Slumps are small rotational slides that are generally shallow. Slow-moving landslides can occur on relatively gentle slopes and can cause significant property damage over time but are far less likely to result in serious injuries than rapidly moving landslides.[30] The best-known example of a slow-moving landslide in Southern California is the Portuguese Bend translational landslide. This event was initially triggered in the 1950s due to road construction and continues

[29] *https://www.usgs.gov/faqs/what-should-i-know-about-wildfires-and-debris-flows?qt-news_science_products=0#qt-news_science_products, accessed November 2021*
[30] *https://www.usgs.gov/natural-hazards/landslide-hazards/science/slow-motion-landslides?qt-science_center_objects=0#qt-science_center_objects, accessed November 2021*

to move even today.[31] This landslide and other historic occurrences are discussed in more detail in the following section.

5.2.1 HISTORIC EVENTS

There are portions of the City of Pomona which are susceptible to landslides and should be mitigated accordingly. The City has a history of landslide events:

CITY OF POMONA

March 2003, Ganesha Park

In March 2003, a landslide occurred in Ganesha Park. The slide caused temporary closure of Paige Drive, which runs alongside the park's popular recreation center. The City commissioned a geotechnical study to investigate the event. It was determined that a buildup of water in the soil- due to irrigation and unexpectedly heavy rainfall- helped to trigger the landslide (in addition to landslides, Ganesha Park also harbors wildfire hazards, and regular irrigation is used to reduce fire threat in the area). Although there was not any significant damage caused by the event, it underscores the vulnerability of local slopes to this type of natural hazard.

February 2005, Phillips Ranch

In February of 2005, a landslide occurred in Phillips Ranch in the area of Meadow View Drive following unprecedented heavy rains. The landslide resulted in six homes being damaged or destroyed and approximately $6 million in damages.

February 2010, 57 & 10 Freeways

In 2010, a landslide occurred near the intersection of the 57 and 10 Freeways, at the transition road from the westbound San Bernardino (10) Freeway to the northbound Orange (57) Freeway in Pomona.[32]

[31] *https://www.rpvca.gov/719/Landslide-Management-Program, accessed November 2021*
[32] *https://www.dailynews.com/2010/02/19/geologists-to-study-pomona-landslide/, accessed November 2021*

Figure 5-2: Pomona Landslide 2010



SOUTHERN CALIFORNIA

In addition to local events, the following examples of historic events in the Southern California region provide baseline information to help understand the types of vulnerabilities and potential damage associated with landslides.[33]

1928, St. Francis Dam Failure Los Angeles County

Built atop the site of an ancient landslide, the dam gave way on March 12, 1928. Its waters swept through the Santa Clara Valley toward the Pacific Ocean, about 54 miles away. Sixty-five miles of the valley were devastated, and over 500 people were killed. Damages were estimated at $672.1 million (year 2000 dollars).

1956, Portuguese Bend Palos Verdes Peninsula

Land use on the Palos Verdes The Portuguese Bend landslide began its modern movement in August 1956, when displacement was noticed at its northeast margin. Movement gradually

[33] *Highland. L.M. and Schuster. R.L. Significant Landslide Events United States. USGS. Washington D.C., http://landslides.usgs.gov. html_files/pubs/report I /Landslides_ pa.*

extended downslope so that the entire eastern edge of the slide mass was moving within 6 weeks. By the summer of 1957, the entire slide mass was sliding towards the sea. This slow-moving landslide continues its movement in the area and is, even today, continuing to threaten the residential community that exists there. The estimated cost thus far is $14.6 million (2000 dollars).

1969, Glendora Los Angeles County

175 houses damaged, mainly by debris flows. Estimated cost: $26.9 million (2000 dollars).

1969, Seventh Ave., Los Angeles County

Damage to California Highway 60. Estimated cost: $14.6 million (2000 dollars).

1970, Princess Park California Highway 14

10 miles north of Newhall, near Saugus, northern Los Angeles County. Estimated cost: $29.1 million (2000 dollars).

1977-1980, Monterey Park. Repetto Hills, Los Angeles County

100 houses damaged in 1980 due to debris flows. Estimated cost: $14.6 million (2000 dollars).

1978, Bluebird Canyon, Orange County

60 houses destroyed or damaged. Unusually heavy rains in March of 1978 may have contributed to initiation of the landslide. Although the 1978 slide area was approximately 3.5 acres, it is suspected to be a portion of a larger, ancient landslide. Estimated cost: $52.7 million (2000 dollars).

1979, Big Rock, California, Los Angeles County

California Highway 1 rockslide. Estimated cost: approximately $1.08 billion (2000 dollars).

1980, Southern California

Estimated cost: $1.1 billion in damage (2000 dollars). Heavy winter rainfall in 1979-80 caused damage in six Southern California counties. In 1980, the rainstorm started on February 8. A sequence of 5 days of continuous rain and 7 inches of precipitation had occurred by February 14. Slope failures were beginning to develop by February 15 and then very high intensity rainfall occurred on February 16. As much as 8 inches of rain fell in a 6-hour period in many locations. Records and personal observations in the field on February 16 and 17 showed that the mountains and slopes literally fell apart on those 2 days. Estimated cost: $1.1 billion in damage (2000 dollars).

1983, San Clemente, California, Orange County. California Highway 1

Litigation at that time involved approximately $43.7 million (2000 dollars). Estimated cost: $65

million (2000 dollars).

1978-1980, San Diego County

Experienced major damage from storms in 1978, 1979, and 1979-80, as did neighboring areas of Los Angeles and Orange County, California. One hundred and twenty landslides were reported to have occurred in San Diego County during these 2 years. Rainfall for the rainy seasons of 78-79 and 79-80 was 14.82 and 15.61 inches (37.6 and 39.6 cm) respectively, compared to a 125-year average (1850-1975) of 9.71 inches (24.7 cm). Significant landslides occurred in the Friars Formation; a unit that was noted as slide-prone in the Seismic Safety Study for the City of San Diego. Of the nine landslides that caused damage in excess of $ I million, seven occurred in the Friars Formation, and two in the Santiago Formation in the northern part of San Diego County.

1995, Los Angeles and Ventura Counties

Above normal rainfall triggered damaging debris flows, deep-seated landslides, and flooding. Several deep-seated landslides were triggered by the storms, the most notable was the La Conchita landslide, which in combination with a local debris flow, destroyed or badly damaged 11 to 12 homes in the small town of La Conchita, about 20 km west of Ventura. There also was widespread debris flow and flood damage to homes, commercial buildings, and roads and highways in areas along the Malibu coast that had been devastated by wildfire two years before.

2005, Los Angeles and Ventura Counties

A subsequent landslide to the March 1995 landslide in La Conchita, this disaster resulted in 10 fatalities and the destruction of 13 homes and damage of 23 additional homes. The 2005 landslide occurred at the end of a 15-day period that produced record and near-record amounts of rainfall in many areas of southern California.[34]

2018, Montecito, Santa Barbara County

The most recent large devastating landslide event in California occurred in Montecito in Santa Barbara County on January 29, 2018. Twenty-three people were killed, at least 167 injured, and more than 400 homes were damaged by a series of debris flows. The debris flows were triggered by heavy rain that fell on steep hillsides that had been burned by the Thomas Wildfire, which at that time was the largest wildfire in California history.[35]

5.2.2 HAZARD LOCATION AND EXTENT

Most of Pomona is located on a flat alluvial plain, and therefore not subject to landslide hazards. However, hillsides in the western portion of the City are considered susceptible to landslides and

[34] *https://pubs.usgs.gov/of/2005/1067/508of05-1067.html#conchita05, accessed November 2021*
[35] *https://www.usgs.gov/faqs/how-many-deaths-result-landslides-each-year?qt-news_science_products=0#qt-news_science_products, accessed November 2021*

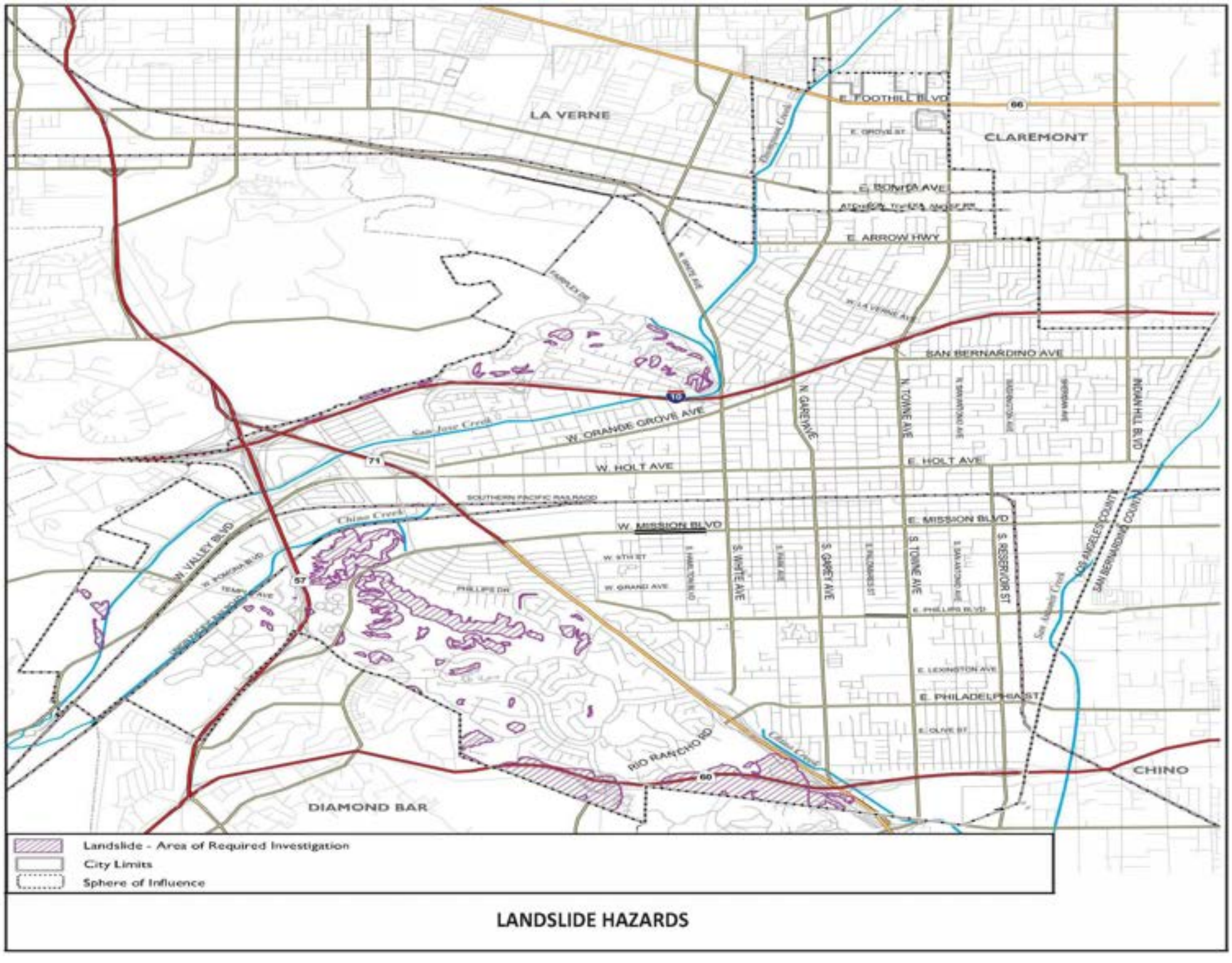
could sustain loss of life and property from this natural hazard. Initial mapping efforts have been conducted by the USGS to determine those areas in the City that have conditions conducive to landslides. **Map 5-1** displays relative susceptibility to landslides, as well as locations where landslides may be triggered by earthquake (this latter information is also mapped in **Map 4-1 Seismic Hazards**). This figure also includes the hillside area addressed in the City's Zoning Ordinance, which is further discussed in **Section 11.2.2 Existing Landslide Mitigation Activities**.

The landslide maps produced by the USGS are an invaluable asset to the City in identifying hazards and preparing mitigation measures. However, these maps were not prepared specifically for Pomona and may not provide the level of detail needed to identify all potentially hazardous areas. Additionally, changing local conditions associated with development may increase the potential for landslides to occur, and this dynamic nature of the hazard is not reflected in these published maps.

An awareness of the conditions that give rise to landslides will assist City officials in making prudent decisions about mitigation measures and regulating future development in areas at-risk to landslides. In general, locations at risk from landslides or debris flows include areas with one or more of the following conditions:

- On or close to steep hills;
- Steep road-cuts or excavations;
- Existing landslides or places of known historic landslides (such sites often have tilted powerlines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground);
- Steep areas where surface runoff is channeled, such as below culverts, V -shaped valleys, canyon bottoms, and steep stream channels;
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons; or
- Canyon areas below hillside and mountains that have recently (within one to six years) been subjected to a wildland fire.

Map 5-1: Landslide Hazards



IMPACTS OF DEVELOPMENT

Although landslides are a natural occurrence, human impacts can substantially affect the potential for landslide failures. The increasing scarcity of developable land, particularly in urban areas, increases the tendency to build on geologically marginal land. Additionally, hillside housing developments in Southern California are prized for the views that they provide. Given the demand for such amenities, and the hazards that are present when building in areas of potential landslides, it is essential to exercise proper planning and geotechnical engineering to reduce the threat of safety of people, property, and infrastructure.

Excavation and Grading

Slope excavation is common in the development of home sites or roads on sloping terrain. Grading these slopes can result in some slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes can be at an increased risk for landslides. The added weight of fill placed on slopes can also result in an increased landslide hazard. Small landslides can be fairly common along roads, in either the road cut or the road fill. Landslides occurring below new construction sites are indicators of the potential impacts stemming from excavation.

Drainage and Groundwater Alterations

Water flowing through or above ground is often the trigger for landslides. Any activity that increases the amount of water flowing into landslide-prone slopes can increase landslide hazards. Broken or leaking water or sewer lines can be especially problematic, as can water retention facilities that direct water onto slopes. However, even excessive lawn irrigation in landslide prone locations can result in damaging landslides.

Ineffective storm water management and excess runoff can also cause erosion and increase the risk of landslide hazards. Development that results in an increase in impervious surface impairs the ability of the land to absorb water and may redirect water to other areas. Channels, streams, ponding, and erosion on slopes all indicate potential slope problems. Road and driveway drains, gutters, downspouts, and other constructed drainage facilities can concentrate and accelerate flow. Ground saturation and concentrated velocity flow are major causes of slope problems and may trigger landslides.[36]

Changes in Vegetation

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

[36] *Homeowners Guide for Landslide Control. Hillside Flooding. Debris Flows, Soil Erosion. (March 1997).*

of landslide.

Conclusion

The geographic extent of landslide hazards in Pomona is relatively small, comprising only a small percentage of the total area of the City. Additionally, the communities present in this area have some of the lower housing densities in the City; the number of people that would be directly impacted by a landslide is estimated to be very low. However, due to the potential for loss of life and property damage that can be caused by landslides, the extent of this hazard could have far-reaching community effects.

5.2.3 PROBABILITY OF FUTURE OCCURRENCE

The probability of a landslide event is fairly low. The City of Pomona has experienced three notable landslide events in the past twenty years; however, hillside areas where landslides could occur account for a small geographic area of the city. Additionally, revisions to the hillside ordinance in 2010 year put additional constraints on new development to decrease the risk of landslides to people and property.

5.3 VULNERABLILITY ASSESSMENT

OVERVIEW

Hillsides where landslides could occur comprise a small portion of the City, but the presence of lifeline routes and many residences in these areas augment the risk of significant damage to the City and its inhabitants. Development in these hillsides increases the risks in locations that are naturally prone to landslides, and where ancient landslides have occurred in the past.

5.3.1 IDENTIFYING VULNERABILITIES

Landslides can affect structures, utility services, transportation lifelines, and critical facilities. Communities may suffer immediate damages and loss of service. Disruption of infrastructure, roads, and critical facilities may also have a long-term effect on the economy. Utilities, including potable water, wastewater, telecommunications, natural gas, and electric power are all essential to service community needs. Loss of electricity has the most widespread impact on other utilities and on the whole community. Natural gas pipes may also be at risk of breakage from landslide movements as small as an inch or two.

LIFELINES AND CRITICAL FACILITIES

No critical facilities are located within areas susceptible to landslides. However, disruption of a

major transportation lifeline could impair access to facilities in the City. To the greatest extent possible, lifelines and critical facilities should remain accessible during a natural hazard event. The impact of closed transportation arteries may be increased if the closed road or bridge is critical for hospitals and other emergency facilities. Therefore, inspection and repair of critical transportation facilities and routes is essential and should receive high priority. Primary transportation routes in Pomona that pass near hillsides at-risk to landslides are SR-57 and SR-60. Although debris that damaged or obstructed these routes would certainly have negative impacts on the flow of traffic, it would not be extremely adverse, as these routes do not pass through the center of the City and there are alternative corridors available should these become compromised. In addition, portions of the Union Pacific Railroad pass by areas that are susceptible to landslides. Debris on the tracks would delay both passenger and freight cargo, and potentially cause serious damage to the tracks.

RECREATION AND COMMUNITY CENTERS

As mentioned in **Chapter 4 Earthquakes**, the popular Ganesha Park is located near slopes susceptible landslides. In response to the landslide event of March 2003 in Ganesha Park (discussed above in the Historic Events portion of **Section 5.2 Hazard Profile**), the City evaluated the risk posed by slope movement, specifically to the park's swimming pool and community center. The City's geotechnical study asserted that in the event of a reoccurrence of slope failure at the site, the slide would be unlikely to reach the community center. The report concluded that this landslide area does not pose significant potential for loss of life or damage to the community center. In order to mitigate future occurrences from slope failure at the site, the City is in the process of requesting bids to implement recommendations contained in the geotechnical report.

VULNERABLE DEVELOPMENT PATTERNS

Fortunately, the majority of landslide-prone locations that have been mapped occur in areas of designated open space. However, nearby residential communities are at-risk to this hazard in portions of Phillips Ranch and of Ganesha Hills. These communities are largely developed, and any new development in these areas should be carefully evaluated to help avoid activities that increase landslide vulnerability.

5.3.2 ESTIMATING POTENTIAL LOSSES

Factors included in assessing landslide vulnerability include population and property distribution in the hazard area, the frequency of landslide or debris flow occurrences, slope steepness, soil characteristics, and precipitation intensity. This type of analysis could generate dollar estimates of the damages to the city due to a specific landslide or debris flow event. At the time of publication of this plan, data was insufficient to conduct a risk analysis and the software needed to conduct this type of analysis was not available.

5.3.3 CLIMATE CHANGE IMPACT

Climate change is a contributing factor for increased droughts, extreme storms, floods, and wildfire, all of which contribute to and can increase the rate and severity of landslides.[37]

[37] *https://climate.nasa.gov/effects/, accessed November 2021*

6 Wildfire

6.1 INTRODUCTION

For thousands of years, fires have been a natural part of the ecosystem in Southern California. However, wildfires present a substantial hazard to life and property in communities built within or adjacent to hillsides and mountainous areas. This risk is present wherever open space areas connect or 'interface' with urban and suburban areas. In California, the hot dry climate and large, mountainous wildland/urban interface area create a tremendous potential for losses due to wildfire.

In the last two decades, Californians have been sharply reminded of the devastating capabilities of wildfire. During this time, records have been broken and broken again in connection with total acres burned and lives and property lost.

6.2 HAZARD PROFILE

HAZARD DESCRIPTION

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly damaging or consuming structures. Wildfires often begin unnoticed and spread quickly, particularly in dry areas, and are usually signaled by dense smoke that fills the area for miles around. These fires are classified into two broad categories.

- A wildland fire is a wildfire in undeveloped areas, which excludes the urbanized regions.
- An urban-wildland interface fire is a wildfire in an area where the vegetative fuel meets or intermingles with wildlands or vegetative fuel.

Although Pomona is not adjacent to a large wildland area, Pomona contains some open space lands in the east. Although the amount of open space is small compared to developed lands in Pomona, the potential for wildland/urban interface fires poses a considerable hazard.

WILDFIRE CHARACTERISTICS

There are three categories of interface fire:[38]

- The classic wildland/urban interface exists where well defined urban and suburban development presses up against open expanses of wildland areas;

[38] *Planning for Natural Hazards: The Oregon Technical Resource Guide. (July 2000) Department of Land Conservation and Development.*

- The mixed wildland/urban interface is characterized by isolated homes, subdivisions and small communities situated predominantly in wildland settings; and
- The occluded wildland/urban interface exists where islands of wildland vegetation occur inside a largely urbanized area, as in the case of Pomona.

Certain conditions must be present for significant interface fires to occur. The most common conditions include hot, dry, and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started. several conditions influence its behavior, including fuel topography, weather, drought, and development.

Fuel

Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is classified by volume and by type. Volume is described in terms of "fuel loading', or the amount of available vegetative fuel.

The type of fuel also influences wildfire. Chaparral is a primary fuel of Southern California wildfires. Chaparral habitat ranges in elevation from near sea level to over 5,000 feet in Southern California. Chaparral communities experience long dry summers and receive most of their annual precipitation from winter rains. Although chaparral is often considered as a single species, there are two distinct types: hard chaparral and soft chaparral. Within these two types are dozens of different plants, each with its own particular characteristics.

An important element in understanding the danger of wildfire is the availability of diverse fuels in the landscape, such as natural vegetation, manmade structures, and combustible materials. A house surrounded by brushy growth rather than cleared space allows for greater continuity of fuel and increases the fire's ability to spread. After decades of fire suppression “dog-hair" thickets have accumulated, which enable high intensity fires to flare and spread rapidly.

Topography

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

Weather

Weather patterns combined with certain geographic locations can create a favorable climate for wildfire activity. Areas where annual precipitation is less than 30 inches per year are extremely

fire susceptible.[39] High risk areas in Southern California share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. The "Santa Ana" winds, which are heated by compression as they flow down to Southern California from Utah, create a particularly high risk, as they can rapidly spread what might otherwise be a small fire.

Drought

Recent concerns about the effects of climate change - particularly drought - are contributing to concerns about wildfire vulnerability. The term drought is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance. Unusually dry winters, or significantly less rainfall than normal, can lead to relatively drier conditions and leave reservoirs and water tables lower. Drought leads to problems with irrigation and may contribute to additional fires, or additional difficulties in fighting fires.

Development

Wildfire has an effect on development, yet development can also influence wildfire. Owners often prefer homes that are private, have scenic views are nestled in vegetation and use natural materials. A private setting may be far from public roads, or hidden behind a narrow, curving driveway. These conditions, however, make evacuation and firefighting difficult. The scenic views found along mountain ridges can also mean areas of dangerous topography. Natural vegetation contributes to scenic beauty, but it may also provide a ready trail of fuel leading a fire directly to the combustible fuels of the home itself.

6.2.1 HISTORIC EVENTS

Large fires have been part of the Southern California landscape for millennia. Written documents reveal that during the 19th Century human settlement of southern California altered the fire regime of coastal California by increasing the fire frequency. This was an era of very limited fire suppression, and yet like today, large crown fires covering tens of thousands of acres were not uncommon. One of the largest fires in Los Angeles County (60,000 acres) occurred in 1878, and the largest fire in Orange County's history, in 1889, was over half a million acres.[40]

2003 SOUTHERN CALIFORNIA FIRES

The fall of 2003 marked the most destructive wildfire season to that date in California history. In a ten-day period, 12 separate fires raged across Southern California in Los Angeles, Riverside, San Bernardino, San Diego, and Ventura counties. The massive "Cedar Fire" in San Diego County consumed 2,800 homes and burned over a quarter of a million acres. Although the 2003 fires did not reach Pomona, they did burn areas of the adjacent city of Claremont, and Santa Ana winds blew heavy smoke into Pomona.

[39] *Ibid.*
[40] *http://www.usgs.gov/public/press/public_affairs/press_releases/pr1805m.html, accessed November 2021.*

2007 SOUTHERN CALIFORNIA FIRES

In late October 2007, Southern California experienced an unusually severe fire weather event characterized by intense, dry, gusty Santa Ana winds. This weather event drove a series of destructive wildfires that took a devastating toll on people, property, natural resources, and infrastructure. Although some fires burned into early November, the heaviest damage occurred during the first three days of the siege when the winds were the strongest. During this siege, 17 people lost their lives, ten were killed by the fires outright, three were killed while evacuating, four died from other fire siege related causes, and 140 firefighters and an unknown number of civilians were injured. A total of 3,069 homes and other buildings were destroyed, and hundreds more were damaged. Hundreds of thousands of people were evacuated at the height of the siege.

The fires burned over half a million acres, including populated areas, wildlife habitats and watersheds. Portions of the electrical power distribution network, telecommunications systems, and even some community water sources were destroyed. Transportation was disrupted over a large area for several days, including numerous road closures. Both the Governor of California and the President of the United States personally toured the ongoing fires. Governor Schwarzenegger proclaimed a state of emergency in seven counties before the end of the first day. President Bush quickly declared a major disaster. While the total impact of the 2007 fire siege was less than the disastrous fires of 2003, it was unquestionably one of the most devastating wildfire events in the history of California.[41]

2017-2020 SOUTHERN CALIFORNIA FIRES

In terms of property damage, 2017 was the most destructive wildfire season on record in California at the time. Throughout 2017, the fires destroyed or damaged more than 10,000 structures in the state (destroyed 9,470, damaged 810), a higher tally than the previous nine years combined. In total 9,133 fires burned 1,248,606 acres. In December 2017, strong Santa Ana winds triggered a new round of wildfires, including the massive Thomas Fire in Ventura County. At the time, the Thomas Fire was California's largest modern wildfire, which has since been surpassed by the Mendocino Complex's Ranch Fire in 2018. The December 2017 fires forced over 230,000 people to evacuate. 2017 will be remembered as a year of extremes. It was the third-warmest year on record for the United States, and it was the second hottest in California, bringing to the surface the question of long-term climate change and its contribution to the 2017 California fires. The hotter temperatures dry out vegetation, making them easier to burn, predisposing vulnerable regions like California to more wildfires in the coming decades as temperatures continue to rise and rainfall continues to decline.[42]

The 2018 wildfire season was the deadliest and most destructive wildfire season on record in California, with a total of over 7,500 fires burning an area of over 1,670,000 acres. In mid-July to August 2018, a series of large wildfires erupted across California, mostly in the northern part of the state. In November 2018, another round of large, destructive fires launched including the Woolsey Fire in Los Angeles and Ventura counties and the Camp Fire in Butte County, which killed at least 85 people.[43]

While 2019 was a relatively mild fire season, it should be noted that Pacific Gas & Electric, Southern

[41] *http://www.fire.ca.gov/fire_protection/downloads/siege/2007/Overview_Introduction.pdf), accessed November 2021*
[42] *https://www.fire.ca.gov/incidents/2017/, accessed November 2021*
[43] *https://www.fire.ca.gov/incidents/2018/, accessed November 2021*

California Edison, and San Diego Gas & electric preemptively shut off power to 800,000 electrical customers to reduce the risk of wildfires by preventing electrical arcing in high winds from their above-ground power lines.[44]

The 2020 California wildfire season was characterized by a record-setting year of wildfires that burned across the state. As of the end of the year, nearly 10,000 fires had burned over 4.2 million acres, more than 4% of the state's roughly 100 million acres of land, making 2020 the largest wildfire season recorded in California's modern history.[45]

6.2.2 HAZARD LOCATION AND EXTENT

Wildfire hazard areas are commonly identified in regions of the wildland/urban interface. In Pomona, this interface is present in the western and southwestern hills. The California Department of Forestry and Fire Protection (CDF) maps levels of fire threat base on groundcover and topography. The increased threat of fires in the hilly areas of Pomona is illustrated in **Map 6-1,** with portions of the Phillips Ranch and Ganesha Hills areas obtaining a "High" and "Very High" level of fire threat. The rest of the City is considered to have a "Moderate" threat of fire as mapped by this system.[46] While groundcover and topography are the primary indices of fire vulnerability, there are other factors that can greatly influence the severity of a fire. Dry weather conditions, the natures of the fuel sources, the presence or absence of drought conditions, and the types of development present all have impacts on fire hazards. In Pomona, the critical times of the year when wildland fires could occur are the late summer and fall months, as the Santa Ana winds deliver hot, dry desert air into the region.

6.2.3 PROBABILITY OF FUTURE EVENTS

Although the probability of future wildfires in the region is high, the fire risk areas of Pomona are largely isolated from the fire prone mountainous areas in the region. Therefore, the probability of large wildfires in the San Gabriel Mountains or other large open space areas in the region spreading to Pomona is not considered a high probability event. However, the City does have large areas of fire risk, particularly in the southwestern corner of the City (in Phillips Ranch, and Cal Poly Pomona areas) and in the Ganesha Hills area. Provided with the right combination of factors (dry vegetation, Santa Ana winds), even a small fire could quickly spread and threaten nearby development.

6.3 VULNERABILITY ASSESSMENT

OVERVIEW

[44] *https://www.fire.ca.gov/incidents/2019/, accessed November 2021*
[45] *https://www.fire.ca.gov/incidents/2020,/, accessed November 2021*
[46] *California Department of Forestry and Fire Protection. website: http://frap.cdf.ca.gov/data/frapgismaps/select.asp, accessed June 6. 2004*

As a highly urbanized area, the risk of wildfire is limited to localized areas (see **Map 6-1**). The probability is very low however, in those areas where the risk from wildfire is considered high, there are a number of vulnerabilities that should be considered in the mitigation planning process. As building recovery continues the area of open space is rapidly diminishing. Very few open areas remain and those are on hillsides with strict building codes to mitigate fire risks.

6.3.1 IDENTIFYING VULNERABILITIES

There are two critical facilities located within a High Threat Zone, and several vulnerable public and private schools. Parts of Cal Poly Pomona are also vulnerable to wildfire. Factors that decrease a structures resistance to fire include combustible roofing material, wood construction, structures with no defensible space, and inadequate access for fire and other emergency vehicles. The highest rated risks from wildfire in Pomona are the residential communities near the wildland/urban interface. Not only are communities in Phillips Ranch and Ganesha Hills subject to fire risk due to prevalence of open spaces combined with steep slopes, but neighborhoods on the outskirts of fire hazard areas can be impacted by fire. This risk increases during Santa Ana wind conditions, with potential for property damage, injury, and fatalities. There are also a small number of facilities and assets that are considered to be at medium risk from wildfires in Pomona. These include the following:

- *Diamond Ranch High School*. The school is located in an area identified with a potential for wildfire. However, the modern building standards used in construction (including noncombustible materials) reduce the potential for damage to the facility.
- *Cal Poly Pomona*. The open spaces around Cal Poly Pomona create the potential for high fire hazard.

6.3.2 ESTIMATING POTENTIAL LOSSES

The primary vulnerability in Pomona to wildfire is development within High or Very High Fire Threat Zones. However, it should be considered that the actual risk to these structures is dependent on a number of factors, most notably construction type, building standards, how a fire spreads, and the response from local fire crews.

6.3.3 CLIMATE CHANGE IMPACT

Climate change is increasing the frequency and severity of wildfires in California. Since 1950, the area burned by California wildfires each year has been increasing, as spring and summer temperatures have warmed, and spring snowmelt has occurred earlier. During the recent "hotter" drought, unusually warm temperatures intensified the effects of very low precipitation and snowpack, creating conditions for extreme, high severity wildfires that spread rapidly. Of the

20 largest fires in California's history, eight have occurred since 2017.[47] The 2020 August Complex Fire is now the largest recorded wildfire in California, more than doubling the 2018 Mendocino Complex Fire's size to become California's largest recorded wildfire.[48]

[47] *https://science2017.globalchange.gov/chapter/8/, accessed November 2021*
[48] *Note: As of the preparation of this report, the Dixie Fire in Northern California has surpassed the August Complex Fire to become the largest in the state's history. As of August 25, 2021, CalFIRE reported more than 735,000 acres burned across five counties. Source: https://www.fire.ca.gov/incidents/2021/7/14/dixie-fire/*

Figure 6-1: Top 20 Largest California Wildfires

	FIRE NAME (CAUSE)	DATE	COUNTY	ACRES	STRUCTURES	DEATHS
1	**AUGUST COMPLEX** *(Lightning)*	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	**1,032,648**	935	1
2	**DIXIE** *(Under Investigation)*	July 2021	Butte, Plumas, Lassen, Shasta & Tehama	**963,309**	1,329	1
3	**MENDOCINO COMPLEX** *(Human Related)*	July 2018	Colusa, Lake, Mendocino & Glenn	**459,123**	280	1
4	**SCU LIGHTNING COMPLEX** *(Lightning)*	August 2020	Stanislaus, Santa Clara, Alameda, Contra Costa, & San Joaquin	**396,624**	222	0
5	**CREEK** *(Undetermined)*	September 2020	Fresno & Madera	**379,895**	853	0
6	**LNU LIGHTNING COMPLEX** *(Lightning/Arson)*	August 2020	Napa, Solano, Sonoma, Yolo, Lake, & Colusa	**363,220**	1,491	6
7	**NORTH COMPLEX** *(Lightning)*	August 2020	Butte, Plumas & Yuba	**318,935**	2,352	15
8	**THOMAS** *(Powerlines)*	December 2017	Ventura & Santa Barbara	**281,893**	1,063	2
9	**CEDAR** *(Human Related)*	October 2003	San Diego	**273,246**	2,820	15
10	**RUSH** *(Lightning)*	August 2012	Lassen	**271,911 CA / 43,666 NV**	0	0
11	**RIM** *(Human Related)*	August 2013	Tuolumne	**257,314**	112	0
12	**ZACA** *(Human Related)*	July 2007	Santa Barbara	**240,207**	1	0
13	**CARR** *(Human Related)*	July 2018	Shasta County & Trinity	**229,651**	1,614	8
14	**MONUMENT** *(Lightning)**	July 2021	Trinity	**223,124**	50	0
15	**CALDOR** *(Under Investigation)*	August 2021	Alpine, Amador, & El Dorado	**221,835**	1,003	1
16	**MATILIJA** *(Undetermined)*	September 1932	Ventura	**220,000**	0	0
17	**RIVER COMPLEX** *(Lightning)**	July 2021	Siskiyou & Trinity	**199,343**	122	0
18	**WITCH** *(Powerlines)*	October 2007	San Diego	**197,990**	1,650	2
19	**KLAMATH THEATER COMPLEX** *(Lightning)*	June 2008	Siskiyou	**192,038**	0	2
20	**MARBLE CONE** *(Lightning)*	July 1977	Monterey	**177,866**	0	0

There is no doubt that there were fires with significant acreage burned in years prior to 1932, but those records are less reliable, and this list is meant to give an overview of the large fires in more recent times.
This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
*Numbers not final.

10/25/2021

Figure 6-2: Top 20 Deadliest California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP FIRE** *(Powerlines)*	November 2018	Butte	153,336	18,804	**85**
2	**GRIFFITH PARK** *(Unknown)*	October 1933	Los Angeles	47	0	**29**
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	2,900	**25**
4	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	5,643	**22**
5	**NORTH COMPLEX** *(Lightning)*	August 2020	Butte, Plumas, & Yuba	318,935	2,352	**15**
6	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	2,820	**15**
7	**RATTLESNAKE** *(Arson)*	July 1953	Glenn	1,340	0	**15**
8	**LOOP** *(Unknown)*	November 1966	Los Angeles	2,028	0	**12**
9	**HAUSER CREEK** *(Human Related)*	October 1943	San Diego	13,145	0	**11**
10	**INAJA** *(Human Related)*	November 1956	San Diego	43,904	0	**11**
11	**IRON ALPS COMPLEX** *(Lightning)*	August 2008	Trinity	105,855	10	**10**
12	**REDWOOD VALLEY** *(Power Lines)*	October 2017	Mendocino	36,523	544	**9**
13	**HARRIS** *(Undetermined)*	October 2007	San Diego	90,440	548	**8**
14	**CANYON** *(Unknown)*	August 1968	Los Angeles	22,197	0	**8**
15	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	1,614	**8**
16	**LNU Lightning Complex** *(Lightning/Arson)*	August 2020	Napa/Sonoma/Yolo/Stanislaus/ Lake	363,220	1,491	**6**
17	**ATLAS** *(Powerline)*	October 2017	Napa & Solano	51,624	781	**6**
18	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	1,003	**6**
19	**DECKER** *(Vehicle)*	August 1959	Riverside	1,425	1	**6**
20	**HACIENDA** *(Unknown)*	September 1955	Los Angeles	1,150	0	**6**

** Fires with the same death count are listed my most recent. Several fires have had 4 fatalties, but only the most recent are listed.
***This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
* Numbers not final

10/22/2021

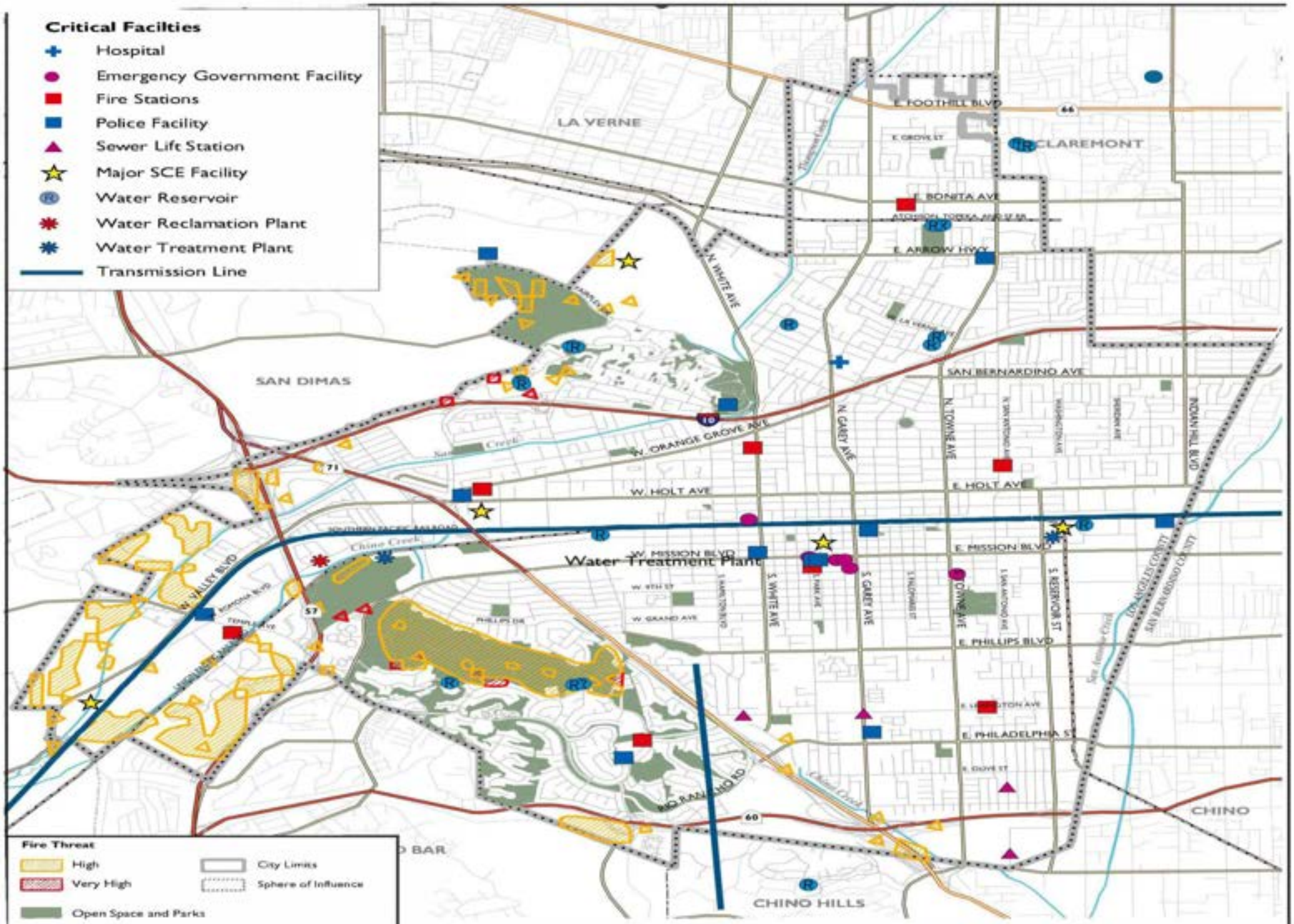
Figure 6-3: Top 20 Most Destructive California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP** *(Powerlines)*	November 2018	Butte	153,336	**18,804**	85
2	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	**5,636**	22
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	**2,900**	25
4	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	**2,820**	15
5	**NORTH COMPLEX** *(Lightning)*	August, 2020	Butte, Plumas, & Yuba	318,935	**2,352**	15
6	**VALLEY** *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	**1,955**	4
7	**WITCH** *(Powerlines)*	October 2007	San Diego	197,990	**1,650**	2
8	**WOOLSEY** *(Electrical)*	November 2018	Ventura	96,949	**1,643**	3
9	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	**1,614**	8
10	**GLASS** *(Undetermined)*	September 2020	Napa & Sonoma	67,484	**1,520**	0
11	**LNU LIGHTNING COMPLEX** *(Lightning/Arson)*	August 2020	Napa, Solano, Sonoma, Yolo, Lake, & Colusa	363,220	**1,491**	6
12	**CZU LIGHTNING COMPLEX** *(Lightning)*	August 2020	Santa Cruz, San Mateo	86,509	**1,490**	1
13	**NUNS** *(Powerline)*	October 2017	Sonoma	54,382	**1,355**	3
14	**DIXIE** *(Under Investigation)**	July 2021	Butte, Plumas, Lassen, & Tehama	963,309	**1,329**	1
15	**THOMAS** *(Powerline)*	December 2017	Ventura & Santa Barbara	281,893	**1,063**	2
16	**CALDOR** *(Under Investigation)*	September 2021	Alpine, Amador, & El Dorado	221,835	**1,003**	1
17	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	**1,003**	6
18	**JONES** *(Undetermined)*	October 1999	Shasta	26,200	**954**	1
19	**AUGUST COMPLEX** *(Lightning)*	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	1,032,648	**935**	1
20	**BUTTE** *(Powerlines)*	September 2015	Amador & Calaveras	70,868	**921**	2

"Structures" include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.
This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
*Numbers not final

10/25/2021

Map 6-1: Areas Susceptible to Wildland Fires



AREAS SUSCEPTIBLE TO WILDLAND FIRES & CRITICAL FACILITIES

7 Flooding

7.1 INTRODUCTION

Flooding has not been a serious hazard to Pomona in several decades, and the risk of disastrous flooding in the City is considered relatively small when compared to the potential for earthquake or wildfire damage to the City. Pomona does not lie within a 100- or 500-year floodplain, as delineated by the Federal Emergency Management Agency (FEMA). Although bisected by several waterways, these creeks have all been channelized, and remain dry except during storm events. However, the potential for a flood event still exists within Pomona, and it is an important hazard to be addressed in the City's LHMP.

7.2 HAZARD PROFILE

HAZARD DESCRIPTION

Flooding hazards are directly related to precipitation (rainfall) intensity and duration. Topography, type and extent of vegetation coverage, area of impermeable surfaces, local slope characteristics, and available drainage facilities all factor into an area's ability to divert precipitation runoff. However, a key element in safely managing runoff volume is the extent of urbanized area. Urbanization increases the volume and velocity of runoff water via two main processes:

- Areas that would normally absorb rainfall (e.g., soils) have been replaced by impermeable surfaces (e.g., streets, houses); and
- The channelization and accumulation of runoff water adds to the collective whole resulting in increased volumes and velocity.

The size, or magnitude, of a flood is described by a term called a "recurrence interval.'' By studying a long period of flow records for a stream, it is possible to estimate the size of a flood that would have a five-year recurrence interval (also called a five-year flood or five-year flood event). A five-year flood is one that would occur, on the average, once every five years (or has 20 percent of occurring during any year). Although a 100-year flood is expected to happen only once in a century, there is a one-percent chance that a flood of that size could happen during any year. The magnitude of flood events could be altered if changes are made to a drainage basin, such as an increase in the amount of impervious (i.e., paved) surfaces.

FEMA, as part of its statutory responsibilities to carry out the National Flood Insurance Program, has mapped most of the flood risk areas within the United States. In fact, most communities with

a one percent chance of a flood occurring in any given year (100-year flood) have a flood way depicted on a Flood Insurance Rate Map (FIRM). However, according to FEMA, Pomona is designated as Flood Zone D, which is an area with "undetermined possible flood hazards". [49]

7.2.1 HISTORIC EVENTS

The history of flooding in Pomona provides an excellent basis to document the effectiveness of existing flood mitigation activities in the City. The flooding hazard is one that has been reduced, through mitigation, from a chronic and damaging natural disaster to a comparatively minor inconvenience to the residents of Pomona.

The City of Pomona is built on the edge of the San Antonio Canyon floodplain, and as a consequence was subjected to regular flooding events throughout its history. Witness reports describe floodwaters to the height of pickup truck beds and floodwaters covering the streets of downtown. In response to a series of particularly disastrous floods in the 1930s, the City developed an extensive network of flood control channels sufficient to provide protection from major flood events (for details on flood channels, refer to the **Section 11.2.4 Existing Flood Mitigation Activities**).[50]

January 1916 Flood

Heavy rainfall during the month of January 1916 resulted in overflowing rivers and streams that devastated much of Southern California. The most significant damage occurred in San Diego County, but San Bernardino, Riverside, Ventura, and Los Angeles Counties were also impacted. Farmlands, dams, bridges, water mains, pipelines, irrigation ditches, wells and pumps, and power plants in these counties were damaged or destroyed. The storms caused the deaths of 22 people in San Diego County, 4 people in Orange County, and 2 people in San Bernardino County. The City of Pomona sustained approximately $15,000 in damage of washes and fills in streets.[51]

March 1938 Flood

A series of almost constant and intense rainfall began during the month of January 1938. By March, much of the terrain in Southern California was already saturated when a slow-moving warm front collided with the Transverse Range resulting in an average of 22.5 inches from February 27 to March 4. The storms resulted in the deaths of 87 people and an estimated $79 million in damage. It was the worst storm on record in nearly 70 years.[52]

January 1969 Flood

Several storms occurred in central and southern California during the months of January and

[49] *https://msc.fema.gov/portal/advanceSearch#searchresultsancho, accessed December 2021*
[50] *Ibid.*
[51] *https://pubs.usgs.gov/wsp/0426/report.pdf, accessed December 2021*
[52] *https://geochange.er.usgs.gov/sw/impacts/hydrology/state_fd/cawater1.html, accessed December 2021*

February resulting in 60 deaths. Approximately $400 million in damage resulted, in large part due to recent home construction in flood prone areas.[53] Peak discharges were 38% to 78% higher than the previous record in March 1938.

The City of Pomona was not alone in improving its flood control measures following the storms that occurred in 1938. The floods that affected the City were widespread and damaging in many cities in the vicinity; regional flood control structures were constructed as part of the Santa Ana River Basin flood protection program, authorized by the Flood Control Acts of 1936 and 1938.[54] These improvements included the San Antonio Dam, which was constructed and is currently located five miles northeast of the City.

Following construction of the flood control measures-which were collectively completed during the late 1950s and 1960s-the City of Pomona witnessed a drastic reduction in flooding hazards. Flooding hazards are now restricted to localized pockets of inundation, primarily in low-lying areas such as underpasses or locations with deficiencies in the storm drainage system. This local flooding occurs on a seasonal basis, depending on the intensity and duration of precipitation during the wet season.

7.2.2 HAZARD LOCATION AND EXTENT

Although Pomona does not lie within a designated floodplain management area, flooding is still a potential hazard to the community. The two types of flooding that could affect the City of Pomona are storm-related flooding and dam inundation.

Although the City has not experienced large-scale storm-related flooding since the construction of flood control infrastructure, localized inundation remains a concern for Pomona residents. Members of the community have indicated that heavy rainfall results in highly localized areas of minor flooding. This assertion is quantified by data provided by the Federal Emergency Management Agency (FEMA). The City has participated in FEMA's National Flood Insurance Program since 1984.[55] Although exact locations of recorded flood damage were unavailable at the time of publication of this plan, known locations with flooding issues include low-lying underpasses and locations with deficiencies in the storm drainage system. While localized flooding does impede traffic flow, the extent of the flooding hazard in Pomona does not overwhelm the City's resources or result in significant adverse impacts.

DAM INUNDATION

The more widespread and serious flooding risk to Pomona is presented by the hazard of dam

[53] *https://pubs.usgs.gov/wsp/2030/report.pdf, accessed December 2021*
[54] *U.S. Army Corps of Engineers, Los Angeles District Reservoir Regulation Section website. http://www.spl.usace.army.mil/resreg/htdocs/snto.html, accessed October 2021*
[55] *Federal Emergency Management Agency. National Flood Program; website: http://www.fema.gov/nfip/104003 I 2.shtm#06, accessed November 4, 2021. Refers to claims processed through December 31, 2020.*

inundation. There are four impoundments in the vicinity of Pomona, two of which have the potential to flood the City in the event of dam failure. Although this hazard would have the potential to cause greater injury and property damage than the storm-related flood events, the likelihood of occurrence is vastly lower.

San Antonio Dam

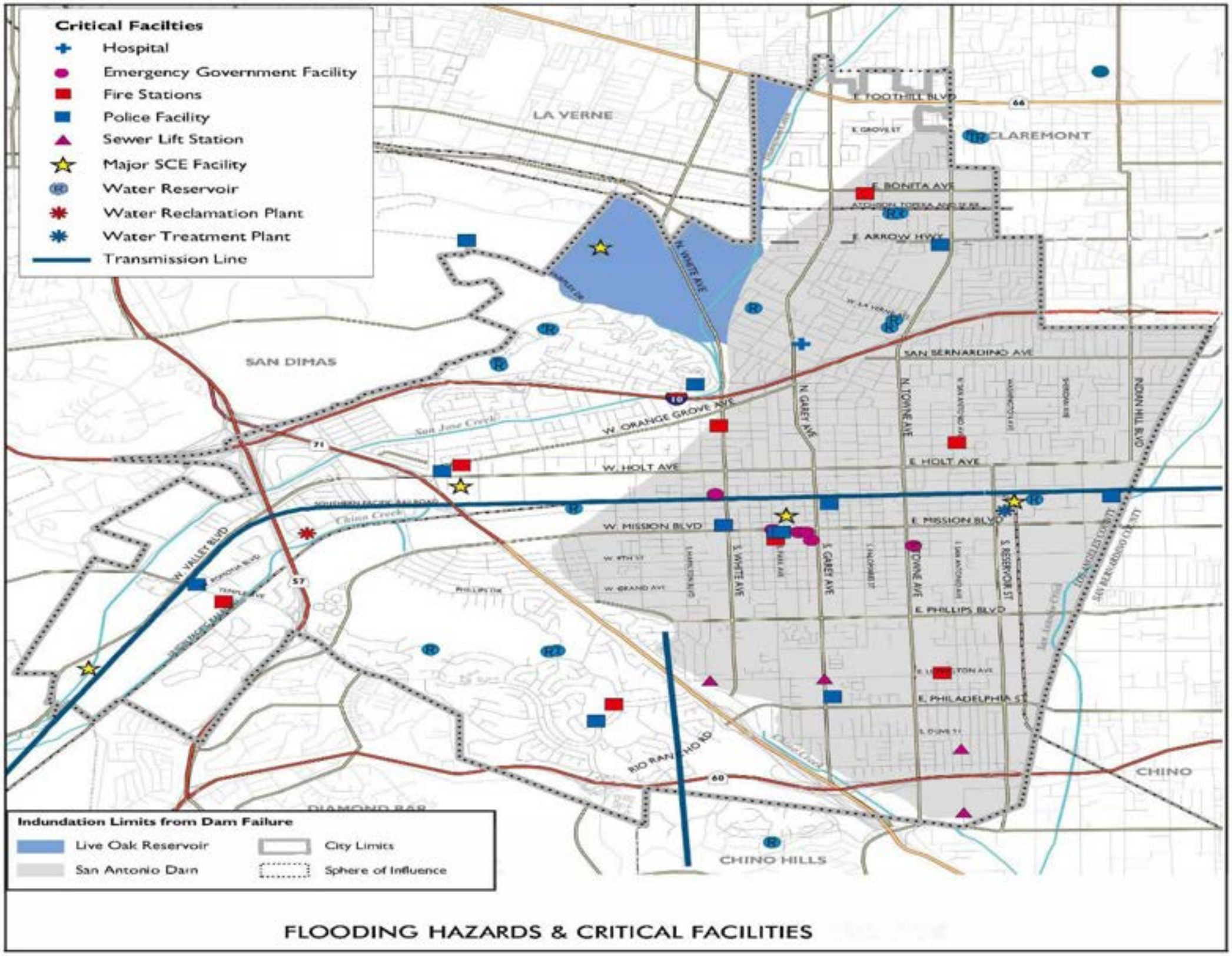
The San Antonio Dam, completed in 1956, is located approximately five miles northeast of the City. The dam is operated by the United States Army Corps of Engineers (USACE). This dam serves primarily as a major flood control structure and therefore does not store large quantities of water except during periods of heavy rain. However, the reservoir has a capacity of 9,350 acre-feet of water and, when full, failure or rupture of the San Antonio Dam would release waters and result in the flooding of areas south of the dam. This area includes large portions of the City, in northern and eastern Pomona. In total, the amount of Pomona at risk to inundation (7,170 acres) equals 48 percent of the City's total land area. The San Antonio Dam inundation boundary is illustrated in **Map 7-1**.

Live Oak Reservoir

The Live Oak Reservoir also poses a flooding threat to Pomona. This reservoir is operated by the Metropolitan Water District of Southern California (MWD) and is utilized for flood control and water conservation purposes. It is located on unincorporated County land between the Cities of La Verne and Claremont, approximately two miles north of Pomona. This reservoir is smaller than the San Antonio Dam and has a maximum capacity of 2,500 acre-feet[56]. In the event of failure of this reservoir, northern portions of the City could be inundated, primarily at the Fairplex. The total amount of land area subject to flooding from this dam is 640 acres, which accounts for four percent of the City. **Map 7-1** illustrates the areas that could be subject to inundation in the event of dam failure.

[56] *City of Pomona Master Environmental Assessment, April 1994, City of Pomona. Materials Recovery Facility Draft Environmental Impact Report. April 1996.*

Map 7-1: Flood Hazards



FLOODING HAZARDS & CRITICAL FACILITIES

FLOOD SEVERITY

The following are ways in which floods may vary in severity:

- Flood volume (the total volume of water in the flood) – this contributes to both the level and duration of flooding. Dams and detention basins are less effective at flood mitigation during large volume floods.
- Rate of rise (how fast the flood rises) – a flood that rises quickly provides less time for warning and evacuation.
- Flow velocity (how fast water is flowing) – faster flow causes a higher risk to human life, a higher risk of erosion, and more damage to infrastructure.
- Flood duration – a flood that lasts for a longer time can have a greater impact due to the increased duration of the disruption to transport, business and personal networks.
- Areal extent – flooding that affects a larger area often has a greater impact.[57]

FLOOD MAGNITUDE

The peak level of water at a particular location in a waterway is called flood magnitude with three classifications:

- Minor – Causes inconvenience such as closing of minor roads and the submergence of low-level bridges.
- Moderate – Inundation in low lying areas requiring removal of livestock and/or evacuation of some houses.
- Major – Inundation of large areas, isolating towns and cities. Major disruptions occur to transportation networks. Evacuation of residents and businesses may be required. In rural areas, widespread flooding of farmland is likely.[58]

7.2.3 PROBABILITY OF FUTURE EVENTS

It is unlikely that the City of Pomona will experience significant storm-related flooding in the future comparable to the scale of floods that took place in its early history. The considerable flood control infrastructure that was developed mid-century has been very effective in preventing large-scale flood events. On the other hand, it is anticipated that localized flooding will continue to occur in the City in the absence of appropriate mitigation measures.

The probability of dam inundation is low. For much of the year, the water levels at these dams are very low or empty. Due to the distance between the reservoirs and Pomona, even in the unlikely event of a dam breach, depending on the water level of the reservoirs, the flood may not

[57] *http://www.chiefscientist.qld.gov.au/floods, accessed January 2022.*
[58] *Ibid.*

even reach City limits.

7.3 VULNERABILITY ASSESSMENT

OVERVIEW

The City of Pomona has a low vulnerability to flood hazards. Current flood control measures effectively prevent the types of damaging floods that were experienced in the 1930s. Current flood issues are restricted to localized street inundation during heavy storm events. With the completion of the I-210 freeway the dam inundation was eliminated.

Although localized flooding occurs seasonally, it has minimal impacts on the City due to its limited location and extent. Dam inundation is also considered to be a low impact hazard. Although it would be far more damaging if it took place, the probability of dam failure is very low due to the engineering standards and safety procedures in place at the dams whose failures would impact the City.

Since the City entered the National Flood Insurance Program (NFIP) in 1984, only 6 total losses have been reported resulting in $42,949 in payments, and no structures have reported repetitive losses.

7.3.1 IDENTIFYING VULNERABILITIES

The City of Pomona is quite resilient to storm-related flooding. Due to the limited scope of the hazard, no structures are considered directly vulnerable to flood damage. The greatest impact caused by storm-related flooding is impediments to the circulation of traffic. Motorists are required to make detours when flooding renders streets impassible. This is typically nothing more than an inconvenience; however, flooding at the underpasses at the Southern Pacific Railroad are a greater vulnerability to Pomona than the other flooding locations.

These major north-south arterials are the only transportation routes that have underpasses constructed beneath the railroad. In the event of a train derailment in the City, it would be crucial for these routes to remain open, as they are the only routes that would not be subjected to closure by a train derailment. North-south circulation in Pomona is crucial to be able to maintain access to the City's only hospital, the Pomona Valley Hospital Medical Center. If the underpasses were flooded during such an event, it would seriously hamper the ability of emergency response vehicles to traverse the City and gain access to the hospital. Although a highly improbable series of events would have to occur in order to result in this scenario, "worst case scenario" analysis is essential to address multi-hazard planning challenges and maximize mitigation effectiveness. For this reason, the underpasses of Garey, White, and Towne Avenues are considered vulnerabilities to the City and are specifically addressed in the multi-hazard action plan items.

With the completion of the I-210 Freeway, the waters from the San Antonio Dam would divert around the city. The freeway is below grade through La Verne, Claremont and Upland which would catch the flow and send the water around Pomona. A new study from the Corps of Engineers and the State is needed to address the new inundation area.

There are relatively few critical facilities and vulnerabilities in the inundation limit of Live Oak Reservoir. The majority of the flooding would occur on grounds currently occupied by the Fairplex. However, approximately 700 residences are located within the inundation area and would require significant emergency evacuation and response in the unlikely event of dam failure. Several neighborhoods in the northwest corner of Pomona are also susceptible to inundation due to dam failure at Thompson Creek.

It is important to emphasize that the risk of widespread, damaging floods from dam inundation is very low. If a dam breach were to occur, the floodwaters would take several hours to reach the City, and the scenario of dam failure In Pomona would be that of a slow-moving, shallow body of water, rather than a catastrophic release of damaging water volumes.

7.3.2 ESTIMATING POTENTIAL LOSSES

Quantifying potential losses due to flooding is a complex process. The primary source of potential flooding damage to the City is dam inundation, a hazard that is highly unlikely to happen. In the event of a dam failure, factors such as the amount of water in the reservoir (both of the reservoirs' water levels fluctuate seasonally), rate of water output, and ability to implement emergency notification procedures would significantly influence the amount of loss sustained by the City.

7.3.3 CLIMATE CHANGE IMPACT

While climate change does not directly cause flooding, climate change can affect the intensity and frequency of precipitation, which in turn increases the potential for flooding. Warmer oceans increase the amount of water that evaporates into the air.[59] When more moisture-laden air moves over land or converges into a storm system, it can produce more intense precipitation—for example, heavier rain and snowstorms. The potential impacts of heavy precipitation include an increase in flood risk due to heavy rains, which in turn can lead to injuries, drownings, and other flooding-related effects on health. In addition, runoff from precipitation can impair water quality as pollutants deposited on land wash into water bodies.

[59] *https://www.epa.gov/climate-indicators/climate-change-indicators-heavy-precipitation, accessed December 2021*

8 Windstorms

8.1 INTRODUCTION

Windstorms have not been a serious hazard in Pomona, and the potential risk of widespread damage from wind is not as considerable as the risk from earthquakes or wildfires. Nevertheless, severe windstorms pose a significant risk to life and property by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause damage to local homes and businesses. Severe windstorms can present a very destabilizing effect on the dry brush that covers local hillsides and urban wildland interface areas and increase wildfire threat. Destructive impacts to trees, power lines, and utility services also are associated with high winds.

8.2 HAZARD PROFILE

HAZARD DESCRIPTION

Santa Ana Winds

Based on local history, most incidents of high wind in the City of Pomona are the result of Santa Ana wind conditions. While high impact wind incidents are not frequent in the area, significant Santa Ana wind events have been known to negatively impact the local community.

Santa Ana winds are blustery, warm – (often hot) – dry winds that blow

Figure 8-1: Santa Ana Winds



from the east or northeast. These occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles basin, and typically occur from October to March when cooler air in the desert increase air pressure and creates the westward winds. Generally speaking, winds must reach 25 knots to be classified as a Santa Ana wind.

The map above (**Figure 8-1**) shows the direction of the Santa Ana winds as they travel from the stable, high-pressure weather system called the Great Basin High through the canyons and towards the low-pressure system off the Pacific. Located between Los Angeles and the San Bernardino Mountains, and south of the San Gabriel Mountains, the City of Pomona is in the direct path of the ocean-bound Santa Ana winds.

8.2.1 HISTORIC EVENTS

In 2003 two deaths were caused by fierce Santa Ana wind conditions. A falling tree struck one woman in San Diego, and the second death occurred when a passenger in a vehicle was hit by a flying pickup truck cover launched by Santa Ana winds. In 2011 the cities west of Pomona suffered millions in damage due to downed trees from the winds over a 2-day period. Power was out for over 1 week in some areas.

In Pomona, the City does not track damage due to windstorms. However, reports of dislodged roofs and fallen trees and power lines are common. These are not considered major widespread threats to population and property but do involve responses from emergency service personnel. Fallen power lines have potential for most widespread consequences of power outages and fire. It should be noted that falling trees can occasionally cause fatalities and serious structural damage. These types of incidents are rare in occurrence as well as localized. Due to their limited impacts, none of the risks associated with windstorm are considered high.

8.2.2 HAZARD LOCATION AND EXTENT

Windstorms that affect Pomona, notably Santa Ana winds, are not location specific but rather impact the entire City area. Passes between hillsides are susceptible to slightly higher wind speeds, although the amount of unsheltered development in hillside passes is not substantial. In the case of a Santa Ana wind - which can last several days - hazards created by wind-fallen trees or utility poles can threaten property and have the potential for personal injury and even death. In Pomona, older neighborhoods generally have larger trees. Although these trees are usually large and well-rooted enough to withstand higher speed winds, tree limbs can create significant hazards.

Various scales for estimating the potential damage caused by wind have been developed. The Beaufort Scale developed by Sir Francis Beaufort in 1805 is commonly used and illustrates the effects that varying wind speeds can have on sea swells and structures.

Table 8-1: Beaufort Scale

BEAUFORT FORCE	SPEED (MHP)	WIND DESCRIPTION – EFFECTS ON LAND
0	< 1	Calm - Smoke rises vertically
1	1 – 3	Light - Air Ripples–look like scales - Smoke drift shows direction of wind, but wind vanes do not
2	4–– 7	Light Breeze - Wind vanes move; Leaves rustle; Wind can be felt
3	8 ––12	Gentle Breeze - Leaves and small twigs move constantly; Small, light flags are extended
4	13– 18	Moderate Breeze - Wind lifts dust and loose paper; Small branches move
5	19– 24	Fresh Breeze - Small trees with leaves begin to move
6	25–31	Strong Breeze - Large branches move; Telegraph wires whistle; Hard to hold umbrellas
7	32– 38	Near Gale - Whole trees move; Resistance felt walking into wind
8	39– 46	Gale - Twigs and small branches break off trees; Difficult to walk
10	55– 63	Storm - Trees broken or uprooted; Considerable structural damage
11	64–73	Violent Storm - Seldom experienced inland; Considerable structural damage
12	> 74	Hurricane - Widespread damage. Very rarely experienced on land.

8.2.3 PROBABILITY OF FUTURE EVENTS

Strong Santa Ana winds typically occur on an annual basis; although it is unlikely that Pomona will be subject to widespread damage from windstorm activity, there is potential for isolated events, such as damage to property or communication utilities from the Santa Ana winds which occur frequently during the October to March season. However, it must also be noted that although Santa Ana winds are frequent, the occurrence of a wind with enough velocity to cause significant damage is much less frequent.

8.3 VULNERABILITY ASSESSMENT

OVERVIEW

Based on local history, the probability is low for a damaging windstorm. There have been past occurrences of winds strong enough to create damage to property in Pomona. However, there has not been a recorded instance of a windstorm strong enough to create widespread damage

in Pomona. Damage is usually restricted to isolated roof and tree damage.

Life and Property

Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region that can be adversely impacted during a windstorm event. This can result in the involvement of City emergency response personnel. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

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

Utilities

Historically, falling trees have been the major cause of power outages in the region. Windstorms can cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet. As such, overhead power lines can be damaged even in relatively minor windstorm events. Falling trees can bring electric power lines down to the pavement, creating the possibility of electric shock.

Infrastructure

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

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

Increased Fire Threat

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur regularly in the

urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions. The higher fire hazard raised by a Santa Ana wind condition requires that even more care and attention be paid to proper brush clearances on property in the wildland/urban interface areas.

Transportation

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

8.3.1 IDENTIFYING VULNERABILITIES

The City of Pomona is not prone to widespread damage from wind and there are no critical facilities and vulnerabilities considered at high risk from windstorms.

8.3.2 ESTIMATING POTENTIAL LOSSES

Potential losses from windstorms are expected to be primarily limited to isolated impacts to property such as roof or tree damage. There are no areas of specific risk in Pomona; losses are not expected to be significant to the City.

8.3.3 CLIMATE CHANGE IMPACT

Climate change is contributing to more severe weather events, including unusually hot and cold temperatures, which in turn impact the pressure systems which create wind events and the severity of windstorm events.

9 Pandemic/Infectious Disease

9.1 INTRODUCTION

This LHMP is being prepared in 2021, during a worldwide pandemic created by the COVID-19 virus. As of December 20, 2021, there have been approximately 51.05 million cases and 807,732 deaths in the United States alone attributed to the virus, which has sparked nationwide stay-at-home orders, shuttered schools, caused severe economic distress, stressed the medical system, and taken a toll on the nation's physical, psychological, and economic well-being. More about the current pandemic is covered further below in this report.

9.2 HAZARD PROFILE

Pandemics are defined as large-scale outbreaks of infectious disease for which there is little or no human immunity. Pandemics cause disease and death over a wide geographic area and cause significant economic disruption.

The California Department of Public Health (CDPH) and Los Angeles County Department of Public Health have identified seasonal influenza and viral disease pandemics as specific hazards that would have a significant impact throughout the entire City of Pomona.

9.2.1 HISTORIC EVENTS

There have been five worldwide pandemics over the past 102 years:

1918 "Spanish Flu" (H1N1 Virus)



The 1918-1919 Spanish Flu was estimated to have sickened 20%-40% of the world's population. Over 20 million people lost their lives. Between September 1918 and April 1919, 500,000 Americans died. The flu spread rapidly; many died within a few days of infection; others from secondary complications. The attack rate and mortality were highest among adults 20-50 years old; the reasons for this are uncertain. By late September 1918, over 35,000 people throughout California had contracted the Spanish Flu. According to state officials, influenza was most prevalent in the southern part of California, but the death toll was high across the state.

1957-1958 "Asian Flu" (H2N2 Virus)

This virus was quickly identified due to advances in technology, and a vaccine was produced. Infection rates were highest among school children, young adults, and pregnant women. The elderly had the highest rates of death. A second wave was developed in 1958 and in total, there were about 70,000 deaths in the United States. Worldwide deaths were estimated between roughly 1 and 2 million.

1968-1969 "Hong Kong Flu" (H3N2 Virus)
The strain of the H3N2 Hong Kong Flu caused approximately 34,000 deaths in the United States and more than 700,000 deaths globally. It was first detected in Hong Kon g in early 1968 and spread to the United States later that year. Those over the age of 65 were most likely to die. This virus returned in 1970 and 1972 and still circulates today.

2009 H1N1 Influenza Virus
The first influenza pandemic of the 21st century occurred in 2009–2010 and was caused by an influenza A (H1N1) virus. It was the first pandemic for which many member States had developed comprehensive pandemic plans describing the public health measures to be taken, aimed at reducing illness and fatalities. For the first time, pandemic vaccinations were developed, produced, and deployed in multiple countries during its first year.

While most cases of pandemic H1N1 were mild, globally it is estimated that the 2009 pandemic caused between 100,000–400,000 deaths in the first year alone. Children and young adults were disproportionately affected in comparison to seasonal influenza, which causes severe disease mainly in the elderly, persons with chronic conditions, and pregnant women.

2019-2021 (Ongoing) Covid-19 Coronavirus (SARS-CoV-2)
The world is currently facing a global viral pandemic caused by a novel coronavirus disease, SARS-CoV-2. Coronaviruses are a large family of viruses that usually cause mild respiratory disease, such as the common cold, but can also cause more serious illness. The virus that causes the Covid-19 is passed from person to person through respiratory secretions, such as saliva or discharge from the nose when one coughs or sneezes. Experts currently researching the virus believe that the virus can also be spread when airborne through aerosols.

The severity of Covid-19 symptoms ranges from mild to severe and affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization. Some of the most common symptoms include fever, dry cough, and fatigue. Less common symptoms include aches and pains, nasal congestion, sore throat, diarrhea, conjunctivitis, headache, loss of taste or smell, a rash on skin, or discoloration of fingers or toes. The most serious symptoms include difficulty breathing or shortness of breath, chest pain or pressure, or loss of speech or movement.

9.2.2 PANDEMIC/INFECTIOUS DISEASE LOCATION AND EXTENT

Pandemic/Infectious Diseases are not location specific but rather impact the entire City and/or regional areas. In March of 2020, the World Health Organization characterized the outbreak as a pandemic, the United States declared the novel coronavirus a national emergency, Los Angeles County declared a local state of emergency.

According to Johns Hopkins University Coronavirus Resource Center, as of December 20, 2021, there have been roughly 275.3 million confirmed cases globally, 5.36 million global deaths, 51.05 million confirmed cases in the United States, and 807,732 US deaths. According to the California Department of Public Health, as of December 20, 2021, there have been 4,935,461 confirmed cases in California and 75,167 deaths, with 1,495,082 confirmed cases in Los Angeles County and 27,441 confirmed deaths. According to the Los Angeles County Department of Public Health, there have been 30,763 confirmed cases and 513 deaths in the City of Pomona to date.

At the time that this is being written, a nationwide and worldwide vaccine and booster campaign is currently underway, with vaccines approved in the United States for individuals age 12 and older. As of December 20, 2021, approximately 8,713,305,104 vaccine doses have been administered worldwide, 496,239,573 doses have been administered in the United States, 62,762,797 have been administered in California and approximately 6,835,658 people have been fully vaccinated in Los Angeles County. At the same time, variants of the disease are spreading, and public health officials are continually monitoring these developments.

Pomona, as well as other cities and regions across the world, faced or are facing high levels of illness, mortality, social disruption, political instability, mass unemployment, and economic losses. Recent impacts range from school and business closings to the interruption of basic essential services such as public transportation, health care/first aid, and the delivery of food and essential medicines to those in need.

The extent of a pandemic or infectious disease outbreak can be measured using **Table 9-1** below.

Table 9-1: Level of Community Transmission

LEVEL OF COMMUNITY TRANSMISSION	COMMUNITY CHARACTERISTICS & DESCRIPTION
Substantial, uncontrolled transmission	Large scale, uncontrolled community transmission, including communal settings (e.g., schools, workplaces)
Substantial, controlled transmission	Large scale, controlled transmission, including communal settings (e.g., schools, workplaces)
Minimal to moderate community transmission	Sustained transmission with high likelihood or confirmed exposure within communal settings and potential for rapid increase in cases

No to minimal community transmission	Evidence of isolated cases or limited community transmission, case investigations underway; no evidence of exposure in large communal settings

9.2.3 PROBABILITY OF FUTURE OCCURRENCE

Evidence suggests that the likelihood of pandemics has increased over the past 100 years because of increased global travel and integration, urbanization, changes in land use, and greater exploitation of the natural environment. These trends likely will continue and will intensify.

The precise timing of a pandemic-scale health-related emergency is uncertain. Pandemic occurrences are most likely when a virus makes a dramatic change, or antigenic shift, that results in a new or "novel" virus to which the population has no immunity. Epidemic occurrences are more likely when there are ecological changes, the pathogen mutates, or the pathogen is introduced into an unprepared host population.

According to the World Bank, increased exposure to wildlife increases the risk to health, biosafety and global security. The current SARS-CoV-2 originated in wildlife; the virus managed to break the species barrier into humans, a phenomenon called zoonosis. Numerous other emerging vector-borne diseases also originated in wildlife and were transmitted to humans.

9.3 VULNERABILITY ASSESSMENT

9.3.1 IDENTIFYING VULNERABILITIES

While the entire population of the planning area may be at risk of infectious diseases and pandemics, some portions of the population may be at greater risk, including the very young, the elderly, and immune-compromised individuals. The recent COVID-19 pandemic also illustrated a greater risk for portions of the population living in areas of concentrated pollution and poverty, who may have greater risk of comorbidity factors that can influence immune response, may not have adequate access to shelter, transportation, healthy foods, and health care, and may not have the opportunity to work from home, or to take time off from work if they become ill.

Critical facilities, the natural environment, and structures would not be impacted by an infectious disease outbreak or pandemic. The most vulnerable aspects of the community are loss of life and potentially long-term health impacts, impacts to essential public services due to closure or limited operating hours of facilities, and the economy, which can suffer great losses if businesses are not able to operate at full capacity. The areas of the economy that are most vulnerable are service oriented, recreation and entertainment, and tourist sectors.

9.3.2 ESTIMATING POTENTIAL LOSSES

There is no way to adequately predict the loss of life, impacts to essential public services, or the economy as a result of an infectious disease outbreak or pandemic, particularly in the case of an emerging infectious disease (EID) or novel virus, where no vaccine exists, little is known about how the disease is spread, the virulence of the disease and how quickly it spreads, how to treat it, and who is at greatest risk.

9.3.3 CLIMATE CHANGE IMPACT

Researchers are studying the impacts of climate change on infectious disease. Loss of biodiversity, destruction of wildlands, and warming temperatures may all be contributing to the spread of infectious disease.

According to the CDC, climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways. Some existing health threats will intensify, and new health threats will emerge. In the U.S., public health can be affected by disruptions of physical, biological, and ecological systems, including disturbances originating here and elsewhere. The health effects of these disruptions include increased respiratory and cardiovascular disease, injuries and premature deaths related to extreme weather events, changes in the prevalence and geographical distribution of food- and water-borne illnesses and other infectious diseases, and threats to mental health.

According to the World Health Organization, climatic conditions strongly affect water-borne diseases and diseases transmitted through insects, snails, or other cold-blooded animals. Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range. Malaria is strongly influenced by climate. Transmitted by Anopheles mosquitoes, malaria kills over 400,000 people every year – mainly children under 5 years old in certain African countries. The Aedes mosquito vector of dengue is also highly sensitive to climate conditions, and studies suggest that climate change is likely to continue to increase exposure to dengue.

While developing nations are more vulnerable to many of these diseases than the United States or the City of Pomona, all populations will be affected by climate change.

10 Goals and Objectives

10.1 INTRODUCTION

One of the steps in preparing the *Local Hazard Mitigation Plan* pursuant to the Disaster Management Act of 2000 is consideration of the City's mission in hazard planning and related goals and objectives. The mission establishes the overarching guiding principle, whereas goals are broad statements of intent and objectives provide direction on actions to achieve the goal. The mission, goals, and objectives were based on the hazard and risk analysis along with input from the Technical Advisory Committee (TAC) and community members.

10.2 MISSION STATEMENT

The City of Pomona's mission for the LHMP is to:

> *Establish a comprehensive strategy of programs, development regulations, and cost-effective improvement projects to protect citizens, critical facilities, infrastructure, private property, and the environment from local hazards.*

The goals and objectives specified below together serve as the framework for formulating the LHMP mitigation strategy, thereby linking the mission statement to the action plan.

10.3 GOALS AND OBJECTIVES FRAMEWORK

PROTECT LIFE AND PROPERTY

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses.
  - *Objective 1.1.1:* Increase the resilience of institutions, services, and lifeline systems that are essential to Pomona' s functioning.
  - *Objective 1.1.2:* Increase the ability of the City government to serve the community during and after events through response, recovery, and rebuilding.
  - *Objective 1.1.3:* Recognize the potential for greater impacts to vulnerable populations and overcrowded neighborhoods in emergency response and mitigation planning.
  - *Objective 1.1.4:* Continue to utilize the emergency management system to provide

early warning of and response to all life-threatening hazards that can be predicted, such as earthquakes, floods, landslides, severe storms, wildfires, and hazardous materials incidents.

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events.
  - *Objective 1.2.1:* Encourage and support the long-term protection of historic and architecturally significant structures to preserve neighborhood and community character.
  - *Objective 1.2.2:* Implement mitigation that effectively addresses the hazard potential while preserving unique historical values.
  - *Objective 1.2.3:* Support the long-term protection of Pomona's neighborhoods by reducing the potential impact to structures from hazard events.

- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development.
  - *Objective 1.3.1:* Coordinate land use plans and regulations to direct development away, or buffer development from, area and site-specific hazards.
  - *Objective 1.3.2:* Continue maintenance programs, such as site inspection and trash/debris removal, to reduce the potential for wildfire and other problems.
  - *Objective 1.3.3:* Encourage insurance coverage for earthquake events.
  - *Objective 1.3.4:* Ensure that new buildings and substantial improvements to existing buildings are governed by and incorporate all appropriate building codes and construction measures to protect them against failure of damage.
  - *Objective 1.3.5:* Implement a program to mitigate the hazards posed by older unreinforced masonry buildings largely clustered in the downtown area.
  - *Objective 1.3.6:* Avoid localized hazards and associated risks to property and people by implementing appropriate improvements, such as construction of stormwater drainage improvements for localized flooding and slope stabilization measures for localized landslide conditions.
  - *Objective 1.3.7:* Avoid localized flooding problems by construction of appropriate storm water drainage improvements.

PUBLIC AWARENESS

- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards.
  - *Objective 2.1.1:* Prioritize community education and outreach in hazard mitigation planning.

- *Objective 2.1.2:* Develop targeted education and outreach programs to segments of the community that are most at-risk to hazards events.
- *Objective 2.1.3:* Encourage the distribution of information to residents, businesses, and public employees on safety and health precautions to take in advance of and during a disaster.
- *Objective 2.1.4:* Utilize local organizations and community partners in preparedness training and post-disaster assistance.
- *Objective 2.1.5:* Advise and assist residents and businesses in taking appropriate mitigation steps to protect their properties.
- *Objective 2.1.6:* Aid both the private and public sectors in understanding the risks they may be exposed to and finding mitigation strategies to reduce those risks.

NATURAL SYSTEMS

- ***Goal 3.1****:* Balance natural resource management and land use planning with local hazard mitigation to protect life, property, and the environment.
  - *Objective 3.1.l:* Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions where possible, recognizing the built-out character of the City.
  - *Objective 3.1.2:* Minimize potential negative environmental impacts from mitigation efforts.

PARTNERSHIPS AND IMPLEMENTATION

- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities.
  - *Objective 4.1.1:* Strengthen communication and coordination with public agencies, citizens, non-profit organizations, business, and industry to ensure support for implementation.
  - *Objective 4.1.2:* Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.
  - *Objective 4.1.3:* Continue developing and strengthening interjurisdictional coordination and cooperation in the area of emergency services and post-disaster response programs.
  - *Objective 4.1.4:* Maintain partnerships with facilities and institutions with populations that are particularly vulnerable to risks associated with local hazards, including emergency planning and post-disaster contingency plans.
  - *Objective 4.1.5:* Coordinate with utility and transportation providers to establish and maintain early warning systems.
  - *Objective 4.1.6:* Periodically review and update the Local Hazards Mitigation Plan, taking into consideration new hazards in formation, changes in vulnerabilities and critical facilities, and advancements in emergency response and post-disaster

services.

EMERGENCY SERVICES

- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events.
  - *Objective 5.1.1:* Prioritize funding and implementation schedules for improvements needed to ensure continuous and extensive emergency response capabilities.
  - *Objective 5.1.2:* Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.
  - *Objective 5.1.3:* Coordinate and integrate local hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
  - *Objective 5.1.4:* Continue providing emergency services with training and equipment to address all identified hazards.
  - *Objective 5.1.5:* Distribute resources for emergency response around the City to ensure accessibility.
  - *Objective 5.1.6:* Conduct periodic emergency preparedness drills involving City staff and emergency services, other emergency service providers, critical facilities, utility operators, community partners, and institutions with vulnerable populations.

11 Mitigation Action Plan

11.1 INTRODUCTION

Risks associated with natural hazards in Pomona are reduced through a variety of programs implemented by federal, state, and local agencies and governments, including the City of Pomona. This chapter sets forth the mitigation action plan that the City is committed to implementing to reduce the potential for risks in the event of earthquake, landslide, wildfire, flooding, windstorm, or pandemic/infectious disease, and to maximize the effectiveness of the emergency response system to avoid injury, life loss, and property damage.

The mitigation actions represent the culmination of the research, mapping, analysis, and community outreach conducted for the LHMP. More specifically, the mitigation considers:

- Risks associated with critical facilities and community vulnerabilities that have been prioritized and ranked using a FEMA approved method;
- LHMP mission, goals and objectives as outlined in **Chapter 10**; and
- Input from City staff and stakeholders and additional research conducted by the project team.

In the process of formulating the mitigation action plan, the Technical Advisory Committee reviewed a series of draft mitigation measures and provided feedback on cost-effectiveness, political will, technical feasibility, and environmental soundness. During this process the TAC helped to identify additional mitigation as well as improve the feasibility and effectiveness of the proposed mitigation given Pomona's unique needs.

For each mitigation action, the following are documented:

- Local hazards addressed;
- Goals and objectives implemented - it should be noted that many of the mitigation actions are designed to achieve multiple goals and objectives;
- FEMA ranking
- Lead department responsible;
- Funding source; and
- Implementation schedule. Mitigation actions currently underway are noted as appropriate. The City will continue to seek assistance through federal, state, and regional funding programs.

RANKING

The Mitigation Action Items were ranked using an approved FEMA method based upon the

following levels:

- *Level 1* - Requires human resources, but not necessarily financial resources
- *Level 2* - Can be accomplished primarily by City staff, but requires financial resources, internal or external
- *Level 3* - Requires external expertise/consultant and financial resources, internal or external
- *Level 4* - Requires multiple entity/agency participation, environmental reviews, and external human and financial resources.

COST-EFFECTIVENESS ANALYSIS FOR MITIGATION

Cost effectiveness analysis is an important tool that the City will use to help prioritize mitigation actions. This process will assist in identifying those actions that maximize risk reduction with efficient expenditure of public funds. Appendix D contains the guidelines for cost effectiveness analysis that the City will follow.

MITIGATION STRATEGY

Pomona uses various City Codes, State Building Codes, State Fire Codes and zoning to promote the best practices in mitigation for the community. The City has already seen that these strategies have had a dramatic reduction in the risk of flooding and wildfire to the community. The City has also seen that a review of building codes after an event and implementing new policies and codes has also reduced the risk to the community for landslides. Recent interest in improving the downtown area has had a significate impact in reducing and mitigating hazards in older historical buildings that populate the downtown area.

The City has designated the Safety & Emergency Management Officer as the Hazard Mitigation Coordinator and a Technical Advisory Committee to steer LHMP implementation. The Coordinator will be responsible for:

- Overseeing implementation of the LHMP.
- Preparing an Annual Report to the City Council in coordination with the Technical Advisory Committee that details mitigation action items to implement in the upcoming year, including cost estimates, cost/benefit or cost-effectiveness analyses (see Appendix D), and recommendations for items to include in the City's Capital Improvement Program.
- Updating the LHMP every five years in coordination with the Technical Advisory Committee by evaluating the cost effectiveness of mitigation implementation, addressing changes in critical facilities and vulnerabilities, incorporating advancements in emergency response and post disaster services, and updating hazard and risk assessments as new information becomes available. This includes incorporating new data from federal, state, or regional hazard mapping and delineation efforts.
- Establishing and maintaining the roster for the Technical Advisory Committee, calling

meetings, and preparing agendas and necessary information materials for meetings.

The Technical Advisory Committee will be comprised of representatives of City departments involved in LHMP implementation, representatives of critical and vulnerable facilities, and community stakeholders involved in emergency preparedness and response. In addition to the roles in the Annual Report and LHMP Five-Year Updates noted above, the Technical Advisory Committee will provide input on community education efforts.

ORGANIZATION OF MITIGATION ACTION ITEMS
The Mitigation Action Items listed in **Section 11.3** are organized by the following purpose categories:

- LHMP Implementation Structure
- Ready Critical Facilities and Emergency Services
- Community Preparedness and Education
- Resilient Housing, Neighborhoods and Commercial Districts
- Risk Reduction for Community Vulnerabilities
- Development Planning and Regulatory Framework
- City Emergency Operation Plan (EOP) and Standardized Emergency Management Systems (SEMS) Planning and Training

11.2 EXISTING MITIGATION ACTIVITIES

11.2.1 EXISTING EARTHQUAKE MITIGATION ACTIVITIES

Existing mitigation activities include current mitigation programs and activities that are being implemented by various levels of government, as well as private and educational organizations.

CITY OF POMONA CODES
Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Pomona Department of Building and Safety enforces building codes pertaining to earthquake hazards. Currently, the City of Pomona uses the California Building Code (CBC) of 2019 as its standard for minimum design and construction standards of new buildings. This most recent code was adopted in 2020 and included the adoption of updated seismic safety standards.

The City of Pomona Planning Department enforces the zoning and land use regulations relating to earthquake hazards. The policy of the City is to reduce unacceptable levels of seismic risk by controlling land use and building design in known fault zones and upon soils that may fail under seismic activity. This policy does not directly regulate specific land uses but leaves final approval of projects to the proper decision-making body, based on information from recommended

geologic studies, and environmental impact reports, when required.

CALIFORNIA EARTHQUAKE MITIGATION LEGISLATION

Threats resulting from earthquakes have been well documented in California. Dating back to the 19th century, Californians have been killed, injured, and lost property as a result of earthquakes. As the State's population continues to grow, and urban areas become even more densely built up, the risk will continue to increase. For decades the Legislature has passed laws to strengthen the built environment and protect the citizens. **Table 11-1** provides a sampling of some of the 200 plus laws in the State's codes.

Hospitals

The Alfred E. Alquist Hospital Seismic Safety Act (Hospital Act) was enacted in 1973 in response to the magnitude 6.6 Sylmar Earthquake in 1971, when four major hospital campuses were severely damaged and evacuated. Two hospital buildings collapsed killing 47 people. Three others were killed in another hospital that nearly collapsed.

In approving the Act, the Legislature noted that:

> *"Hospitals, that house patients who have less than the capacity of normally healthy persons to protect themselves, and that must be reasonably capable of providing services to the public after a disaster, shall be designed and constructed to resist, insofar as practical, the forces generated by earthquakes, gravity and winds (Health and Safety Code Section 1 29680)."*

When the Hospital Act was passed in 1973, the State anticipated that, based on the regular and timely replacement of aging hospital facilities, the majority of hospital buildings would be in compliance with the Act's standards within 25 years. However, hospital buildings were not, and are not, being replaced at that anticipated rate. In fact, the great majority of the States urgent care facilities are now more than 40 years old.

Table 11-1: Partial List of California Laws on Earthquake Safety

CODE SECTION	DESCRIPTION
Government Code Section 8870- 8870.95:	Creates Seismic Safety Commission.
Government Code Section 8876.1 - 8776.10:	Established the California Center for Earthquake Engineering Research.
Public Resources Code Section 2800 - 2804.6:	Authorized a prototype earthquake prediction system along the central San Andreas fault near the City of Parkfield.
Public Resources Code Section 2810 – 2815:	Continued the Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project.
Health and Safety Code Section 16100 –	The Seismic Safety Commission and State

16110:	Architect will develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings.
Government Code Section 8871- 8871.5:	Established the California Earthquake Hazards Reduction Act of 1986.
Health and Safety Code Section 130000-130025:	Defined earthquake performance standards for hospitals.
Public Resources Code Section 2805 – 2808:	Established the California Earthquake Education Project.
Government Code Section 8899.10 - 8899.16:	Established the Earthquake Research Evaluation Conference.
Public Resources Code Section 2621 – 2630 2621:	Established the Alquist-Priolo Earthquake Fault Zoning Act.
Government Code Section Public 8878.50 - 8878.52 8878.50:	Created the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990.
Education Code Section 35295 - 35297 35295:	Established emergency procedure systems in kindergarten through grade 12 in all the public or private schools.
Health and Safety Code Section 19160-19169:	Established standards for seismic retrofitting of unreinforced masonry building.
Health and Safety Code Section 1596.80-1596.879:	Required all child day care facilities to include an Earthquake Preparedness Checklist as an attachment to their disaster plan.

The magnitude 6.7 Northridge Earthquake in 1994 caused $3 billion in hospital-related damage and evacuations. Twelve hospital buildings constructed before the Act were cited (red tagged) as unsafe for occupancy after the earthquake. Those hospitals that had been built in accordance with the 1973 Hospital Act were very successful in resisting structural damage. However, nonstructural damage (for example, plumbing and ceiling systems) was still extensive in those post-1973 buildings.

Senate Bill 1953 ("SB 1953"), enacted in 1994 after the Northridge Earthquake, expanded the scope of the 1973 Hospital Act. Under SB 1953, all hospitals are required, as of January 1, 2 008, to survive earthquakes without collapsing or posing the threat of significant loss of life. The 1994 Act further mandates that all existing hospitals be seismically evaluated, and retrofitted, if needed, by 2030, so that they are in substantial compliance with the Act (which requires that the hospital buildings be reasonably capable of providing services to the public after disasters). SB 1953 applies to all urgent care facilities (including those built prior to the 1973 Hospital Act) and affects approximately 2,500 buildings on 475 campuses.

BUSINESSES/PRIVATE SECTOR

Natural hazards have a devastating impact on businesses. In fact, of all businesses which close following a disaster, more than forty-three percent never reopen, and an additional twenty-nine percent close for good within the next two years[60]. The Institute of Business and Home Safety has developed "Open for Business ", which is a disaster planning toolkit to help guide businesses in preparing for and dealing with the adverse effects of natural hazards. The kit integrates protection from natural disasters into the company's risk reduction measures to safeguard employees, customers, and the investment itself. The guide helps businesses secure human and physical resources during disasters and helps to develop strategies to maintain business continuity before, during, and after a disaster occurs.

EARTHQUAKE EDUCATION

Earthquake research and education activities are conducted at several major universities in the Southern California region, including Cal Tech, USC, UCLA, UCI, and UCSB. The local clearing house for earthquake information is the Southern California Earthquake Center (SCEC), located at the University of Southern California, Los Angeles, CA 90089, Telephone: (213) 740-5843, Fax: (213) 740-0011, Email: SCEinfo@usc.edu Website: http://www.scec.org. The SCEC is a community of scientists and specialists who actively coordinate research on earthquake hazards at nine core institutions and communicate earthquake information to the public. The SCEC is a National Science Foundation (NSF) Science and Technology Center and is co-funded by the United States Geological Survey (USGS).

In addition, Los Angeles County along with other Southern California counties sponsors the Emergency Survival Program (ESP), an educational program for learning how to prepare for earthquakes and other disasters. Many school districts have very active emergency preparedness programs that include earthquake drills and periodic disaster response team exercises.

Proposed Earthquake Mitigation Action Items

The earthquake mitigation action items provide guidance on suggesting specific activities that agencies, organizations, and residents in the City of Pomona can undertake to reduce risk and prevent loss from earthquake events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation. The City of Pomona proposes the following earthquake mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.3: Reinforcement of Other City Facilities
- Mitigation Action 2.5: Aging Water and Sewer Infrastructure Replacement

[60] *Institute for Business and Home Safety Resources. August 2021.*

- Mitigation Action 4.1: Unreinforced Masonry Buildings
- Mitigation Action 4.2: Vulnerable Building Reinforcement
- Mitigation Action 4.3: Valuing Heritage
- Mitigation Action 4.5: Expanded Code Enforcement in Overcrowded Neighborhoods

11.2.2 EXISTING LANDSLIDE MITIGATION ACTIVIES

LANDSLIDE BUILDING AND ZONING CODES

The City of Pomona Development Code addresses development on steep slopes in subsection 580I0 concerning development for hillside properties. These sections outline standards for areas with median slopes of 10 percent or more before grading. Generally, the ordinance requires larger lot sizes based on slope percentage, as is indicated in **Table 11-2.** The ordinance also allows for building design to accommodate the site, landscaping to protect against erosion, drainage, and controls for excavations and grading. The Hillside provisions also allow for a Hillside Advisory Review Committee to review development plans in hillside areas.

Table 11-2: Minimum Lot Sizes in Residential Hillside Areas

GRADE OF SLOPE (PERCENT)	MINIMUM LOT SIZE (SQ. FT.)
0 - 10	7,200
10 - 30	10,000
30 - 40	20,000
40 or more	1 acre
Source: City of Pomona Zoning Ordinance, 1971-1972; revised 2010	

Proposed Landslide Mitigation Action Items

The City of Pomona proposes the following landslide mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 4.6: Landslide Prevention
- Mitigation Action 4.7: Landslide Prevention Development Standards

11.2.3 EXISTING WILDFIRE MITIGATION ACTIVITIES

Existing mitigation activities include current mitigation programs and activities that are being implemented by county, regional, state, or federal agencies or organizations.

LOCAL PROGRAMS

In Southern California there are dozens of independent local fire departments as well as large county wide consolidated fire districts. Although each district or department is responsible for fire related issues in specific geographic areas, they work together to keep Southern California residents safe from fire. Although fire agencies work together to fight urban/wildland interface fires, each separate agency may have a somewhat different set of codes to enforce for mitigation activities.

In Pomona, fire protection is provided by the Los Angeles County Fire Department. The Fire Department not only provides response to fire emergencies, but also provides fire prevention, brush clearance, and education programs.

FIRE CODES

Developments within high fire threat are subject to the City of Pomona Zoning Ordinance and the California Building Code. These codes require buildings to incorporate fire resistant materials, maintain setbacks between buildings, and maintain landscaping and clear fire hazard brush. Both the Zoning Ordinance and the Building Code are subject to regular updates.

FEDERAL PROGRAMS

Federal Emergency Management Agency (FEMA) Programs

FEMA is directly responsible for providing fire suppression assistance grants and, in certain cases, major disaster assistance and hazard mitigation grants in response to fires. The role of FEMA in the wildland/urban interface is to encourage comprehensive disaster preparedness plans and programs, increase the capability of state and local governments, and provide for a greater understanding of FEMA programs at the federal, state and local levels.[61]

Fire Suppression Assistance Grants

Fire Suppression Assistance Grants may be provided to a state with an approved hazard mitigation plan for the suppression of a forest or grassland fire that threatens to become a major disaster on public or private lands. These grants are provided to protect life and improved property and encourage the development and implementation of viable multi-hazard mitigation measures and provide training to clarify FEMA's programs. The grant may include funds for equipment, supplies and personnel. A Fire Suppression Assistance Grant is the form of assistance most often provided by FEMA to a state for a fire. The grants are cost-shared with states. FEMA's US Fire Administration (USFA) provides public education materials addressing wildland/urban interface issues and the USFA's National Fire Academy provides training programs.

[61] *Source: National Interagency Fire Center. Boise ID and California Division of Forestry, Riverside Fire Lab.*

National Wildland/Urban Interface Fire Protection Program

Federal agencies can use the National Wildland/Urban Interface Fire Protection Program to focus on wildland/urban interface fire protection issues and actions. The Western Governors' Association (WGA) can act as a catalyst to involve state agencies, as well as local and private stakeholders, with the objective of developing an implementation plan to achieve a uniform, integrated national approach to hazard and risk assessment and fire prevention and protection in the wildland/urban interface. The program helps states develop viable and comprehensive wildland fire mitigation plans and performance-based partnerships.

Proposed Wildfire Mitigation Action Items

The City of Pomona proposes the following wildfire mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.3: Reinforcement of Other City Facilities
- Mitigation Action 2.5: Aging Water and Sewer Infrastructure Replacement
- Mitigation Action 4.4: Reduced Wildfire Threat

11.2.4 EXISTING FLOOD MITIGATION ACTIVITIES

Flood mitigation activities listed here include current mitigation programs and activities that are implemented by the City of Pomona or other agencies.

FLOOD MANAGEMENT PROJECTS

Flood management structures can assist in regulating flood levels by adjusting water flows upstream of flood-prone areas. There are four dams in the immediate vicinity of the City, holding a total roughly 30,000 acre-feet of water. Releases of water from the impoundments are designed to protect the City of Pomona from high floodwaters. These facilities are:

- San Antonio Dam and Reservoir. 9,350 acre-feet (San Antonio and Chino Creeks);
- Live Oak Reservoir. 2,500 acre-feet (Live Oak)[62]
- Puddingstone Dam and Reservoir. 17,400 acre-feet (Walnut Creek); and
- Thompson Creek Dam and Reservoir. 812 acre-feet (Cobal, Williams, Palmer, Padua, and Thompson Creeks). [63]

[62] *City of Pomona. Materials Recovery Facility Draft Environmental Impact Report. April 1996.*
[63] *Los Angeles County Department of Public Works. Hydrologic Report 1996-1997.*

STORMWATER SYSTEMS

Pomona has an extensive storm drainage network to prevent flooding by conveying water off the streets and into drainage channels. Its existing drainage system is an urban network that generally consists of curbside catch basins, inlet structures, and manholes connected by reinforced concrete laterals and main lines, draining into storm drain channels. The City has approximately 30 miles of drainage pipes and 300 miles of streets that are designed to withstand a 100-year storm event.

Storm water runoff is transported via this network to five major channels. These channels are lined with concrete and designed to accommodate a 200-year storm event: [64]

- *San Antonio Creek and Flood Control Channel*. Located along the westerly and southwesterly limits of the City, it connects to Chino Creek going south;
- *Chino Creek*. Located along the southerly portion of the city in the Puente Hills, it joins to San Antonio Creek further south;
- *Thompson Creek*. Runs from north to south through the northern portion of the City, it bends westward and becomes North San Jose Creek;
- *North San Jose Creek.* Located in the western part of the City, it drains to the Whittier Narrows; and
- *South San Jose Creek*. Parallel to and south of North San Jose Creek in the western portion of the City, stalling from the Corona Expressway and going southwest; drains to the Whittier Narrows.[65]

DAM EMERGENCY PREPAREDNESS

Due to the potential severity of dam failures, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Plans have been established by the USACE and MWD to protect residents and businesses of the affected area in case of dam failures.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The City of Pomona actively promotes the public participation in the National Flood Insurance Program at every opportunity. City Code Section 18-600 Flood Plain Management was enacted in 2006 to address the requirements of the NFIP and to mitigate the Flood Hazard in the City of Pomona.

[64] *City of Pomona. Master Environmental Assessment. 1994.*
[65] *Ahmad Ansaru. City of Pomona P.E., Assistant City Engineer. Written communication. February 6, 2004.*

Proposed Flooding Mitigation Action Items

The City of Pomona proposes the following wildfire mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.6: Localized Flood Control Improvements

11.2.5 EXISTING WINDSTORM MITIGATION ACTIVITIES

As stated, one of the most common problems associated with windstorms is power outage. High winds can cause trees to bend, sag, or fail (tree limbs or entire trees), coming into contact with nearby distribution power lines. Fallen trees can cause short-circuiting and conductor overloading. Wind-induced damage to the power system causes power outages to customers, incurs cost to make repairs, and in some cases can lead to ignitions that start wild land fires.

CALIFORNIA CODE

One of the strongest and most widespread existing mitigation strategies pertains to tree clearance. Currently, California State Law requires utility companies to maintain specific clearances depending on the type of voltage running through the line -between electric power lines and all vegetation.

The following California Public Resource Code Sections establish tree pruning regulations:[66]

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

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

- Title 14: Minimum Clearance Provisions
- Sections 1250-1258
- General Industry Safety Orders
- Title 8: Group 3: Articles 12, 13, 36, 37, 38
- California Penal Code Section 385

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

- California Public Utilities Commission
- General Order 95: Rule 35

[66] *www.cpuc.ca.gov/js.asp*

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

The power companies, in compliance with the above regulations, collect data about tree failures and their impact on power lines. This mitigation strategy assists the power company in preventing future tree failure. From the collection of this data, the power company can advise residents as to the most appropriate vegetative planting and pruning procedures.

Proposed Windstorm Mitigation Action Items

The City of Pomona proposes the following windstorm mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.8: Build and Retrofit Public Buildings and Critical Facilities
- Mitigation Action 4.2: Vulnerable Building Reinforcement

11.2.6 EXISTING PANDEMIC/INFECTIOUS DISEASE MITIGATION ACTIVITIES

Pandemic/infectious disease outbreaks have the potential to impact not only human lives, but the economic and governing stability of cities. The City of Pomona implemented the following policies in 2007 to protect City staff in the event of an infectious disease outbreak to ensure that City services can be maintained:

- Safety Policy Bloodborne Pathogens
- Safety Policy Respiratory Protection
- Safety Policy Tuberculosis Exposure

These policies were adopted to minimize exposure and outline procedures for reporting and seeking proper treatment following an exposure event.

Proposed Pandemic/Infectious Disease Mitigation Action Items

Due to the COVID 19 pandemic, several measures were adopted in addition to the policies listed above to protect City employees, and additional measures were implemented to protect vulnerable populations, and the economic interests in the City. These mitigations are proposed for inclusion in this LHMP in the event of a future pandemic/infectious disease outbreak:

- Mitigation Action 2.7 City Employee Protection
- Mitigation Action 4.8 Business Community Protection
- Mitigation Action 5.1 Vulnerable Population Services

11.3 MITIGATION ACTION ITEMS

LHMP IMPLEMENTATION STRUCTURE

Mitigation Action 1.1: **Implementation Options for Hazard Mitigation**

Secure necessary funding for implementation of hazard mitigation actions as follows:

- Allocate City resources and assistance for hazard mitigation projects, using available City resources efficiently and with consideration of cost-effectiveness analysis;
- Identify and seek grant programs and foundations that may support mitigation activities; and
- Partner with other government agencies, special districts, utility providers, and organizations involved in hazard mitigation and emergency preparedness and response to pursue grants and special funding programs.

Lead Department: Development Services, Public Works, or Water Resources, depending on the project
Implementation Schedule: Ongoing; apply for grants on an annual basis
Hazards Addressed: All Hazards
Funding Source: General fund, and federal, state, and regional grants
Rank: Level 1
Goals and Objectives Implemented: All

READY CRITICAL FACILITIES AND EMERGENCY SERVICES

Mitigation Action 2.1: **Integrity of Emergency Operation Center**

Maintain the system of the Emergency Operation Center (Brackett Airport in the City of Laverne, at the Pomona Police Department Hanger) with alternative back-up facilities to be activated in the event the central facility is impaired. Because emergency service response times will decrease if back-up locations must be activated, maximize resiliency of the Central Emergency Operations Facility.

Lead Departments: Risk Management
Implementation Schedule: 2022 on schedule
Hazards Addressed: All Hazards
Funding Source: General Fund
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.4).

- ***Goal 5.1:*** Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1.3, 5.1.4).

Mitigation Action 2.2: **Equip Back-up Emergency Operations Center**

Because the Emergency Operations Center and backup locations were previously clustered in the City center, activating the emergency response system could be impeded if the City center experienced extensive damage during a major earthquake. To ensure response capabilities, the City has designated and will work to equip a backup facility. The Pomona City Yard has been chosen because it is located outside of the City center, south of the I-10 freeway and outside of liquefaction zones.

Lead Department: Risk Management
Implementation Schedule: Complete in 2022
Hazards Addressed: All Hazards
Funding Source: General fund
Rank: Level 2
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.4).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1. 3, 5.1.4, 5.1.5).

Mitigation Action 2.3: **Reinforcement of Historic City Facilities**

Conduct a structural assessment of City-owned properties that are on or eligible for the National Register of Historic Places, the list of California Historic Landmarks, or Pomona's list of local significance, to identify buildings needing seismic safety improvements. Prioritize improvements according to 1) minimizing injury and life loss, 2) ensuring emergency services and response, 3) ensuring distribution of hazard resistant emergency facilities across the City to maximize emergency response and accessibility.

Lead Department: Development Services
Implementation Schedule: Ongoing; review for available funds annually
Hazards Addressed: Earthquake, Wildfire
Funding Source: General fund and grants
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.3).
- ***Goal 5.1****:* Ensure continued operations when impacted by local hazard events (Objective

5.1.1).

Mitigation Action 2.4: **Establish " Lifeline" Circulation System**

North-south circulation in Pomona could be significantly diminished in the event a long freight train is stranded on the Southern Pacific Railroad due to an earthquake or other hazard event. North-south circulation could also be impaired by significant flooding in the railroad underpasses at White, Towne, and Garey Avenues or the associated bridge collapses due to an earthquake. These scenarios are of particular concern given the location of the City's only hospital north of these potential obstructions and the majority of City population to the south, and require the following actions:

- In the next update of the *General Plan* Safety Element and the *SEMS Plan,* establish "Life-line" circulation system whereby special protocols are enacted to manage traffic flows on White, Towne, and Garey Avenues to ensure adequate north-south access for emergency vehicles. Establish alternative Life-line streets in the event these streets are obstructed, including completion of bridge if the Metrolink Gold Line is extended to Montclair;
- Continue prioritizing maintenance of the pumps in the underpasses;

Lead Department: Development Services, Public Works

Implementation Schedule: Maintenance of pumps ongoing; update to Safety Element General Plan to address evacuation routes to follow the adoption of this LHMP update

Hazards Addressed: All Hazards

Funding Source: General fund and grants

Rank: Level 4

Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.4).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objective 5.1.3).

Mitigation Action 2.5: **Aging Water and Sewer Infrastructure Replacement**

As an older City with the development in the City center dating back to the late 1800s - including the system of water wells and - pipelines portions of the City' s water and sewer infrastructure are in need of extensive maintenance and /or replacement. Older infrastructure is more prone to damage and service disruptions during earthquake, with potential ramifications for public safety and firefighting capabilities. Continue to fund and prioritize water and sewer infrastructure improvements to reduce the potential for these hazard-related risks. Use the Sewer and Water Master Plans as the basis for the improvement schedule.

Lead Department: Water Resources
Implementation Schedule: Ongoing; review for available funds annually
Hazards Addressed: Earthquake, Wildfire

Funding Source: General funds and grants
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury. and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objective 1.1.1).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objective 5.1.1).

Mitigation Action 2.6: Localized Flood Control Improvements

While the City has an effective flood control system, several localized areas continue to be subject to storm-related flooding. These include underpasses at the intersections of Garey, Towne, and White Avenues and the Union Pacific Railroad tracks; East End Avenue, between Mission Boulevard and Grand Avenue; Ninth Street, between the Union Pacific Railroad tracks and East End Avenue; and cul-de-sacs bounded by SR-60, County Road, Garey Boulevard, and Reservoir Street.

Conduct a study of these localized flooding hazards and identify needed improvements. Determine priority for implementation in part with cost-effectiveness analysis. Once the improvements are identified, consider options for requiring construction of the improvements as part of development projects if appropriate and feasible.

Lead Department: Public Works and Water Resources
Implementation Schedule: Ongoing; 1 – 2 years to complete study
Hazards Addressed: Flooding
Funding Source: 500k from General fund for pump and electrical improvements at Reservoir and 1st Street grade separation.
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objective 1.1.1).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objective 5.1.1).

Mitigation Action 2.7: City Employee Protection

A pandemic or emerging infectious disease has the potential to severely disrupt City services. During the COVID-19 pandemic, the City established protocols for safely continuing City operations during a pandemic or emerging infectious disease incident. Implement the following

actions:

- Provide work from home opportunities
- Ensure field staff can work alone or use PPE and social distancing measures
- Provide additional equipment and stagger staff shifts

Lead Department: Public Works, Water Resources
Implementation Schedule: This mitigation was implemented during the COVID19 pandemic and can be implemented as necessary in the event of a surge or a new infectious disease outbreak.
Hazards Addressed: Pandemic/Infectious Disease
Funding Source: General fund and available grant funds
Ranking: Level 2
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1.4).

Mitigation Action 2.8: **Build and Retrofit Public Buildings and Critical Facilities**

Public buildings and critical facilities should be constructed or retrofitted to be to the highest standard that is feasible. Improve roof coverings, anchor roof-mounted equipment, and avoid placing flag poles or antennas near buildings.

Lead Department: Public Works, Neighborhood Services, Development Services
Implementation Plan: Ongoing, case-by-case basis when new facilities are constructed, or deficiencies are found in older facilities
Hazards Addressed: Windstorms
Funding Source: General fund and grant funds
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1.4).

COMMUNITY PREPAREDNESS AND EDUCATION

Mitigation Action 3.1: **Emergency Preparedness Campaigns**

Continue implementing customized campaigns to educate residents and businesses about appropriate emergency preparedness measures and what to do in the event of a disaster, using the following means of communication:

- Incorporation of special publications and inserts in the City's newsletter and other mailings such as utility bills;
- Traveling booths to set up in shopping centers, community centers, popular athletic fields, schools, and other activity centers;
- Information posted on website and social media;
- Media releases;
- Reports to City Council and City Commissions;
- Presentations to community organizations;
- Events such as the Police Department Open House, Child Safety Fair, and National Night Out; and

When designing and developing campaigns, give special attention to language, demographic, and cultural characteristics of the Pomona population to maximize effectiveness. Target vulnerable populations such as the elderly, poor, disabled, and non-English speakers.

Given the age of many Pomona homes and commercial structures, there should be frequent emphasis on insurance coverage and techniques to secure buildings to avoid seismically induced damage, including information on available assistance programs. Information should be periodically distributed about non-structural improvements to mitigate hazard risks, such as securing bookcases, filing cabinets, light fixtures, and similar objects that can cause injuries and block exits.

Lead Department: Police
Implementation Schedule: Ongoing; events take place quarterly and annually
Hazards Addressed: All Hazards
Funding Source: General fund
Rank: Level 2
Goals and Objectives Implemented:

- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 2.1.1 - 2.1.6).

- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities (Objectives 4.1.1, 4.1.2, 4.1.4).

RESILIENT HOUSING, NEIGHBORHOODS AND COMMERCIAL DISTRICTS

Mitigation Action 4.1: **Unreinforced Masonry Buildings**

Continue requiring improvements to meet seismic safety standards for unreinforced masonry buildings when a change in use is proposed with tenant improvements.

Lead Department: Development Services
Implementation Schedule: Ongoing; case-by-case as change of use projects are submitted to the City with tenant improvement plans.
Hazards Addressed: Earthquake
Funding Source: Development/permit fees
Rank: Level 1
Goals and Objectives Implemented:

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.1, 1.2.2, 1.2.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.4, 1.3.5).

Mitigation Action 4.2: Vulnerable Building Reinforcement

Much of the City was developed prior to current seismic standards. Older homes and buildings may require structural intervention to avoid significant damage in the event of a major earthquake or severe windstorm. In addition, the clusters of mobile homes in the City may need reinforcements such as foundation strappings. Structural interventions are often straightforward and cost-effective, such as bolting structures to foundations. Through community education campaigns, educate property owners about areas with structures potentially needing reinforcement, and provide technical assistance to property owners with vulnerable buildings to implement retrofit standards.

This action will be most effective when City building inspection staff are directed to prioritize identification and reinforcement of vulnerable buildings, are appropriately trained to detect vulnerable buildings and make reasonable, cost-efficient recommendations, and are consulted during formulation of community education campaigns.

Lead Department: Development Services
Implementation Schedule: Ongoing; case-by-case as improvement plans are submitted to the City, and educational materials provided at the Development Services Department counter.
Hazards Addressed: Earthquake, Windstorm
Funding Source: General fund
Rank: Level 2
Goals and Objectives Implemented:

- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.3, 1.3.4).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase

public awareness of the risks associated with natural hazards (Objectives 2.1.5, 2.1.6).

Mitigation Action 4.3: **Valuing Heritage**

Many of Pomona's designated historic buildings, as well as homes within the designated historic districts, do not meet seismic safety codes. Pomona's historic resources contribute greatly to local environment and culture and are tremendously valued by the community. Prioritize retrofitting City-owned historic structures and avoid demolition for the purpose of public safety. Explore opportunities for federal and state grants for structural improvements to make City-owned buildings safer in lieu of demolition.

Lead Department: Development Services
Priority: Ongoing; annually review department budget and pursue grants
Hazards Addressed: Earthquake
Funding Source: General fund and grants
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.1, 1.2.2, 1.2.3).

Mitigation Action 4.4: **Reduce Wildfire Threat**

Continue existing programs to reduce risk of property damage and injury from wildfire, including:

- Citywide prohibition of new wood and wood shake roofing materials, and requirement of fire-resistant materials for re-roofing projects.
- Requirement of tile roofs in Phillips Ranch;
- Development of fire-resistant landscape program in coordination with Ganesha Hills homeowners; and
- County Fire Department weed abatement and brush clearance program.

Further measures to reduce the risks of wildfire include:

- Exploring options for further decreasing fire hazards through requirements established by ordinance in Ganesha Hills; and
- Limiting any increases in residential densities in wildfire hazard areas through appropriate land use policy applications in the General Plan Update.

Lead Department: Development Services, Fire Department
Implementation Schedule: Ongoing; review department funds and resources for development of new ordinances. Review of re-roofing projects occur on case-by-case basis as projects are

submitted to the City.
Hazards Addressed: Wildfire
Funding Source: General fund and grants
Ranking: Level 4
Goals and Objectives Implemented:

- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objective 1.3.1).
- ***Goal 3.1****:* Balance natural resource management, and land use planning with local hazard mitigation to protect life, property, and the environment (Objective s 3.1.1, 3.1.2).

Mitigation Action 4.5: Expanded Code Enforcement in Overcrowded Neighborhoods

In Pomona's overcrowded neighborhoods:

- Step up code enforcement efforts, with particular emphasis on remediation of illegally inhabited building spaces that increase risks of injury or life loss in the event of a major earthquake.
- Significantly increase fees for code violations pertinent to public health and safety, so that the fees serve as a deterrent; and
- Continue enforcing stiff fines imposed on homeowners and contractors implementing structural modifications without appropriate permits.

Lead Department: Development Services
Implementation Schedule: Implemented, and ongoing as regular inspections are conducted, or complaints received
Hazards Addressed: Earthquakes
Funding Source: General fund and code violation fees
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities. (Objective 1.1.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objective 1.3.4).

Mitigation Action 4.6: Landslide Prevention

Prioritize routine maintenance and repairs of water, sewer, and irrigation lines in and around landslide prone areas to avoid long-term leaks that saturate and de-stabilize earth materials to point of dangerous and destructive landslides.

Lead Department: Water Resources, Community Services, Public Works
Implementation Schedule: Ongoing**;** irrigation lines inspected on quarterly basis
Hazards Addressed: Landslide
Funding Source: General fund
Ranking: Level 2
Goals and Objectives Implemented:

- ***Goal 3.1****:* Balance natural resource management, and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3.1.2).

Mitigation Action 4.7: **Landslide Prevention Development Standards**

Revise the City Grading Ordinance and development standards for hillside properties implemented through the " H" Overlay Zone to include best management practices for landslide prevention. Review the extent of property subject to the overlay to ensure that all landslide potential areas are included and also continue applying the standards to all property meeting the requirements of "Hillside Area" as defined in Development Code Section 58010.

Lead Department: Development Services
Implementation Schedule: Zoning and Development Code currently undergoing update; completion expected by 2023.
Hazards Addressed: Landslide
Funding Source: General fund and grants
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events (Objective 1.2.3).
- ***Goal 3.1****:* Balance natural resource management, and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3. 1.2).

Mitigation Action 4.8: **Business Community Protection**

During an infectious disease outbreak, businesses can become severely impacted and may require modified operations from what would normally be permitted. Additionally, the city may need to modify normal operations to ensure development applications can continue. To protect the local economy, the following actions should be taken to ensure business operations and development can continue:

- Wave temporary use/special event permit fees,
- Work with businesses to modify operations for social distancing,
- Establish protocol for electronic submission of applications,

- Teleconferencing should be used in place of in person meetings whenever possible.
- Provide information to businesses about grants for PPE.

Lead Department: Development Services
Implementation Schedule: This mitigation was implemented during the COVID19 pandemic and can be implemented as necessary in the event of a surge or a new infectious disease outbreak.
Hazards Addressed: Pandemic/Infectious Disease
Funding Source: General fund and available grant funds
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.2, 5.1.3, 5.1.4).

RISK REDUCTION FOR COMMUNITY VULNERABILITIES

Mitigation Action 5.1: **Vulnerable Population Services**
Vulnerable populations may be particularly impacted by a pandemic or infectious disease outbreak. The following mitigation can be implemented to reduce those impacts to the most vulnerable populations in the city:

- Employ eviction prevention programs,
- Provide emergency housing vouchers, rental assistance, and legal services,
- Hold vaccination events in areas easily accessible by vulnerable populations,
- Host zoom events for underprivileged children in the community.

Lead Department: Neighborhood Services
Implementation Schedule: This mitigation was implemented during the COVID19 pandemic and can be implemented as necessary in the event of a surge or a new infectious disease outbreak.
Hazards Addressed: Pandemic/Infectious Disease
Funding Source: General fund, and available grant funding including homeless prevention grants
Ranking: Level 4
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2, 1.1.3).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 5.1.1, 5.1.2, 5.1.5).

DEVELOPMENT PLANNING AND REGULATORY FRAMEWORK

Mitigation Action 6.1: **General Plan and Development Code Update**

In the General Plan Update and associated Zoning Code amendments, integrate the hazards and risk assessment and mitigation in the new policy framework, with special attention to avoidance of new risks from proposed development, protection of environmental resources, appropriate level of public services and facilities, and circulation system effectiveness. As indicated in **Section 1.4**, the Safety Element of the General Plan will be updated to address evacuation routes following the adoption of this LHMP update. Establish development policies that encourage and support redevelopment of aging building stock, consistent with community vision and goals.

Lead Department: Development Services
Implementation Schedule: Development Code update currently underway with completion expected in 2023. Complete General Plan update in the next 4-5 years.
Hazards Addressed: All Hazards
Funding Source: SB 2 grant and general fund
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objective 1.1.3).
- ***Goal 1.2***: Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.2, 1.2.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.1, 1.3 .4, 1.3.5,1.3.6).
- ***Goal 3.1****:* Balance natural resource management and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3.1.2).

Mitigation Action 6.2: **Development Project Review for Natural Hazards Risks**

When reviewing proposals for new development and infrastructure improvement projects, identify any natural hazards that have the potential to impact the property. If current building and development codes do not adequately address identified natural hazard impacts associated with a specific project, require additional mitigation to be incorporated into the project. Include this requirement in all project review procedures.

Lead Department: Development Services
Implementation Schedule: Ongoing; case-by-case basis as development projects are submitted to the City.
Hazards Addressed: All Hazards
Funding Source: User fees, permit fees, and environmental review fees
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objective 1.1.3).
- ***Goal 1.2***: Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.2, 1.2.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.1, 1.3 .4, 1.3.5,1.3.6).
- ***Goal 3.1****:* Balance natural resource management and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3.1.2).

CITY EMERGENCY OPERATION PLAN (EOP) AND STANDARDIZED EMERGENCY MANAGEMENT SYSTEMS (SEMS) PLANNING AND TRAINING

Mitigation Action 7.1: **Pomona SEMS Plan**

Continue to implement the Pomona SEMS Plan contained within the City's EOP*,* which functions as the City's manual for communications protocol in the event of a disaster. Update as needed for consistency with the State SEMS Plan involving interagency communication protocols, and this LHMP. Mobile command center system recently purchased for the Emergency Operation Center.

Lead Department: Risk Management
Implementation Schedule: Ongoing; review SEMS plan annually for consistency with State SEMS Plan.
Hazards Addressed: All Hazards
Funding Source: General plan and grants
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential injury, and economic damage residents and businesses by Emergency preparedness for life loss, to Pomona maximizing capabilities. (Objectives 1.1.2, 1.1.3, 1.1.4).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 2.1.1, 2.1.2, 2.1.3, 2.1.4).
- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities (Objectives 4.1.1, 4.1.3, 4.1.4, 4.1.5).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.2, 5.1.3).

Mitigation Action 7.2: **Emergency Preparedness Drills**

Pursuant to the City's Emergency Operations Plan (EOP)*,* conduct emergency preparedness and response drills for mock major earthquake events, the natural hazard with the greatest potential

for injury, loss life, property damage, and service interruptions. Drills should test disaster response systems and communication protocols. When preparing the drills, consider the wide range of potential risks associated with critical facilities and vulnerabilities, such as interrupted service at Pomona Valley Hospital Medical Center, street blockages from paused trains, major power service disruption, etc. Include representatives of City officials and staff, utility providers and the railroad operators, as well as trained community emergency response volunteers and emergency response stakeholders, and representatives of vulnerable facilities.

After the drill, analyze the strengths and weaknesses of the response effort and identify facility and infrastructure deficiencies contributing to response concerns. Use this information to inform priorities established in the LHMP Annual Report.

Lead Department: Risk Management
Implementation Schedule: Ongoing, on annual basis
Hazards Addressed: All Hazards
Funding Source: General plan and grants
Ranking: Level 4
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.3, 1.1.4).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 2.1.1, 2.1.2, 2.1.3, 2.1.4).
- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities (Objectives 4.1.1, 4.1. 3, 4.1.4, 4.1.5, 5.1.2, 5.1.3, 5.1.4, 5.1.6).

Mitigation Action 7.3: City Hall Life Safety Planning

Immediately following a disaster, community members will rely on City staff for assistance and direction. Part of the City's plan for maximizing emergency services must include taking care of staff's emergency needs so that they can function and serve the community. Without the ready services of City staff, the likelihood of hazard impacts to the community could increase.

Update City Hall Life Safety Preparedness Plan, conduct employee training, ensure that each department has complete first-aid kit, and hold emergency evacuation drills at City Hall on an annual basis. In addition, help staff establish reserve of personal emergency supplies, by buying kits at discounted prices and selling at-cost to staff or designating a team captain in each department to help individuals bring in appropriate kit.

Lead Department: Risk Management
Implementation Schedule: Ongoing; drills conducted annually and updates to Life Safety

Preparedness Plan to occur as needed
Hazards Addressed: All Hazards
Funding Source: General fund and grants
Ranking: Level 2
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1. 2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.4, 5.1.6).

11.4 PROGRESS IN LOCAL MITIGATION EFFORTS

Several Mitigation Actions included in **Section 11.3**, reflect actions that are ongoing as part of regular operations conducted by the City in an effort to mitigate or reduce the impacts of local hazards on the community. Some of these Mitigation Actions have been recently completed but may include some ongoing effort or additional component to complete in entirety. Additionally, some of the Mitigation Actions have been included that were implemented during the COVID 19 pandemic, that may be implemented if a future pandemic or infectious disease outbreak occurs in the City as necessary and based on relevance in a novel situation. The following Mitigation Actions reflect efforts that are ongoing as part of regular City operations:

- Mitigation Action 1.1: Implementation Options for Hazard Mitigation
- Mitigation Action 2.3: Reinforcement of Historic City Facilities
- Mitigation Action 2.4: Establish " Lifeline" Circulation System (component of this action is ongoing)
- Mitigation Action 2.5: Aging Water and Sewer Infrastructure Replacement
- Mitigation Action 2.8: Build and Retrofit Public Buildings and Critical Facilities
- Mitigation Action 3.1: Emergency Preparedness Campaigns
- Mitigation Action 4.1: Unreinforced Masonry Buildings
- Mitigation Action 4.2: Vulnerable Building Reinforcement
- Mitigation Action 4.3: Valuing Heritage
- Mitigation Action 4.4: Reduce Wildfire Threat
- Mitigation Action 4.5: Expanded Code Enforcement in Overcrowded Neighborhoods
- Mitigation Action 4.6: Landslide Prevention
- Mitigation Action 6.2: Development Project Review for Natural Hazards Risks
- Mitigation Action 7.1: Pomona SEMS Plan
- Mitigation Action 7.2: Emergency Preparedness Drills

- Mitigation Action 7.3: City Hall Life Safety Planning

The following Mitigation Action was completed during the preparation of this LHMP update:

- Mitigation Action 2.1: Integrity of Emergency Operation Center

The following Mitigation Actions were implemented during the COVID 19 pandemic and can be reinstated as necessary or relevant:

- Mitigation Action 2.7: City Employee Protection
- Mitigation Action 4.8: Business Community Protection
- Mitigation Action 5.1: Vulnerable Population Services

Appendix A:

Public Participation Survey Materials & TAC Meeting Agendas

PUBLIC SURVEY FLYER – ENGLISH AND SPANISH





PUBLIC SURVEY SOCIAL MEDIA POST



Liked by **pomonapd** and **32 others**

cityofpomona Are you prepared for when disaster strikes? We need your feedback! Complete our 2021 Local Hazard Mitigation Plan Survey. Your opinion matters to us. Survey ➡️ bit.ly/PomonaLHMP1

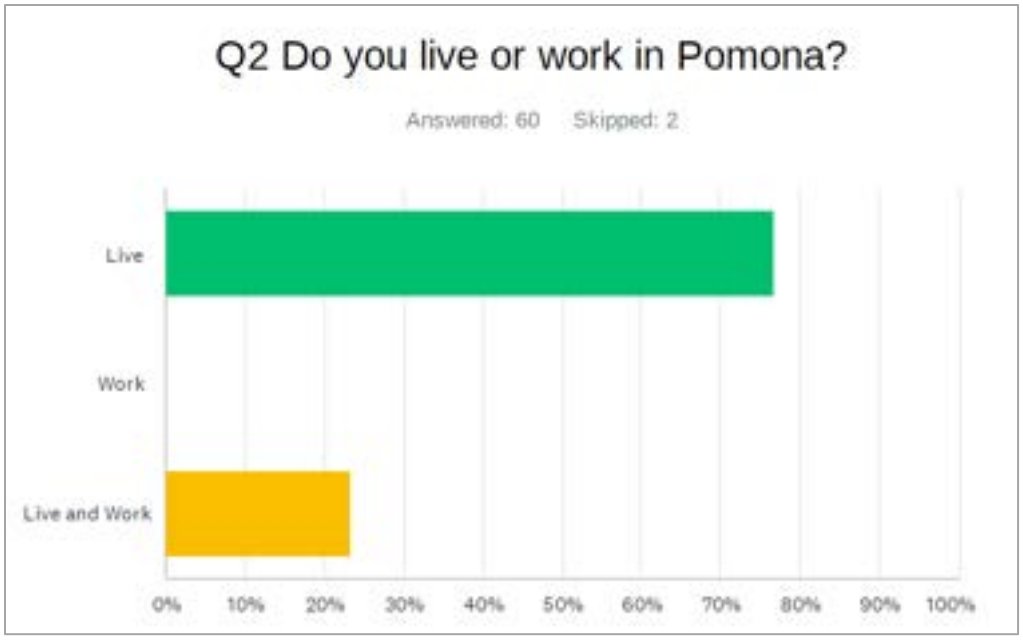
¿Está usted preparado para cuando ocurra un desastre? Necesitamos sus comentarios. Completa nuestra encuesta de actualización del plan de mitigación de peligros locales de 2021. Tu opinión nos importa. Encuesta ➡️ bit.ly/PomonaLHMP2

View 1 comment

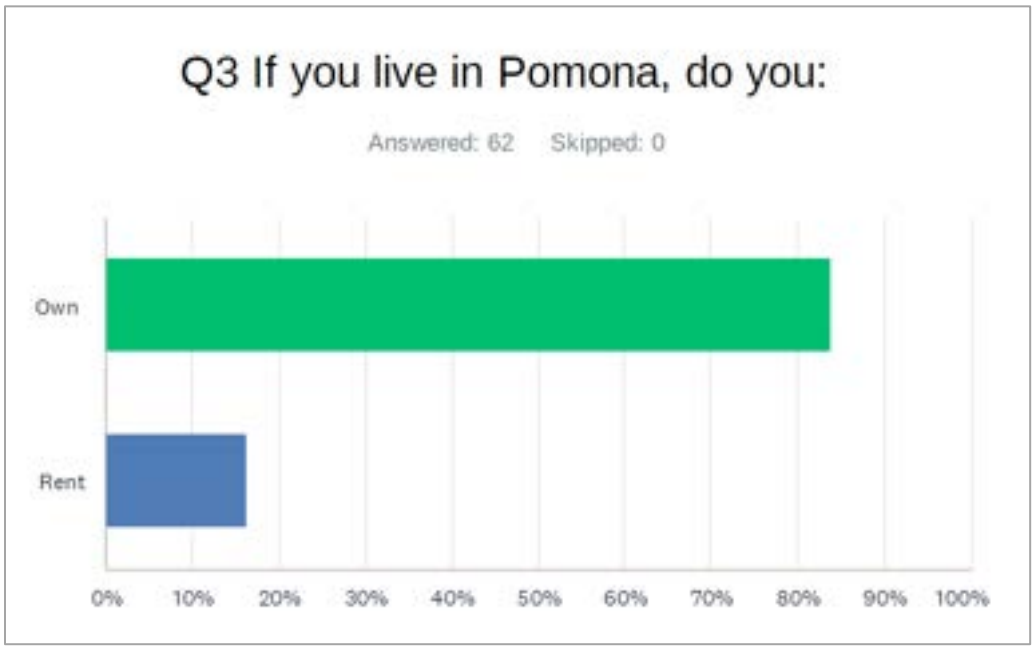
2021 Pomona Local Hazard Mitigation Plan Update Survey

1. Your Zip Code Answers varied and Community Name or Location Answers varied

2. Do you: ☐ Live or ☐ Work in Pomona?



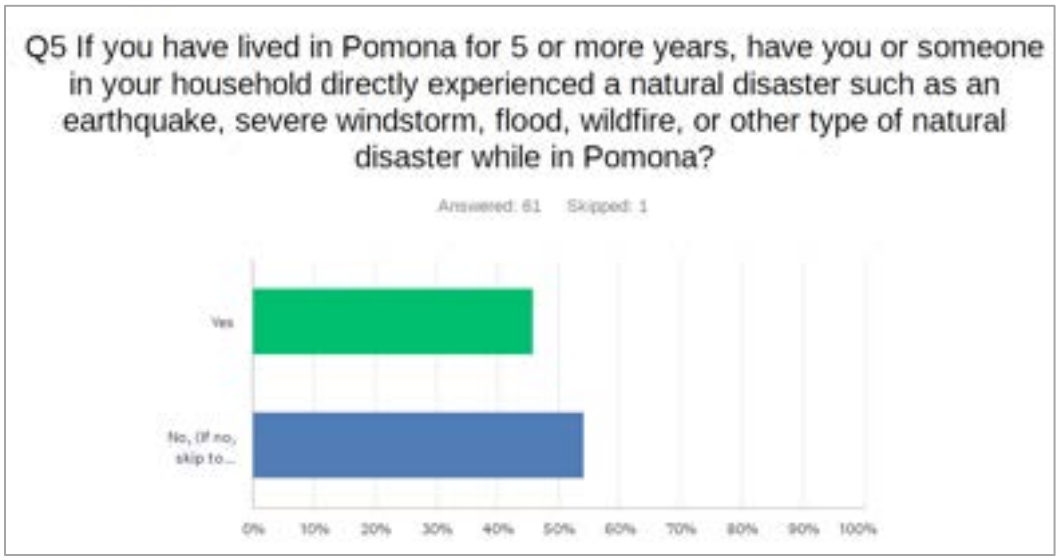
3. If you live in Pomona, do you: ☐ Own or ☐ Rent?



4. If you live in Pomona, how many years? Answers varied from 1 to 50 years.

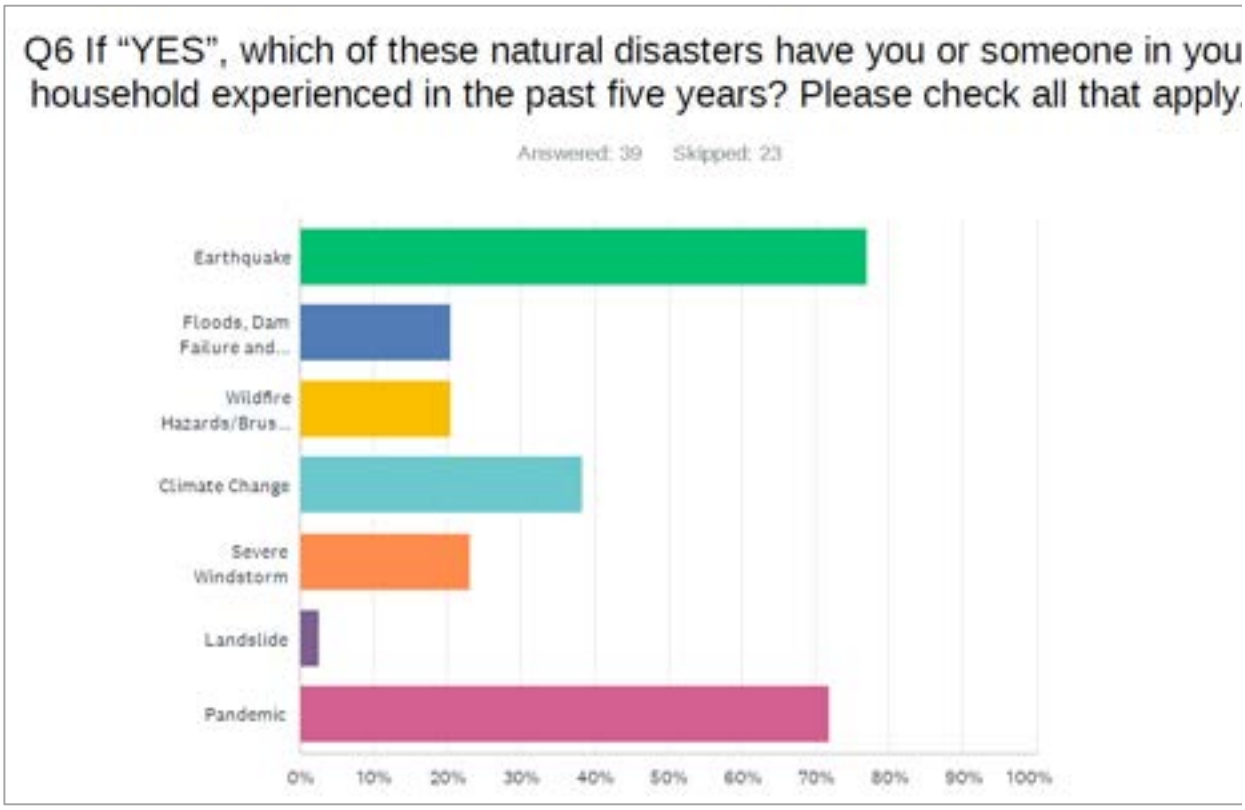
5. If you have lived in Pomona for 5 years or more, have you or someone in your household directly experienced a natural disaster such as an earthquake, severe windstorm, flood, wildfire, or other type of natural disaster while in Pomona?

☐ Yes ☐ No (**IF NO, skip to question 7**)



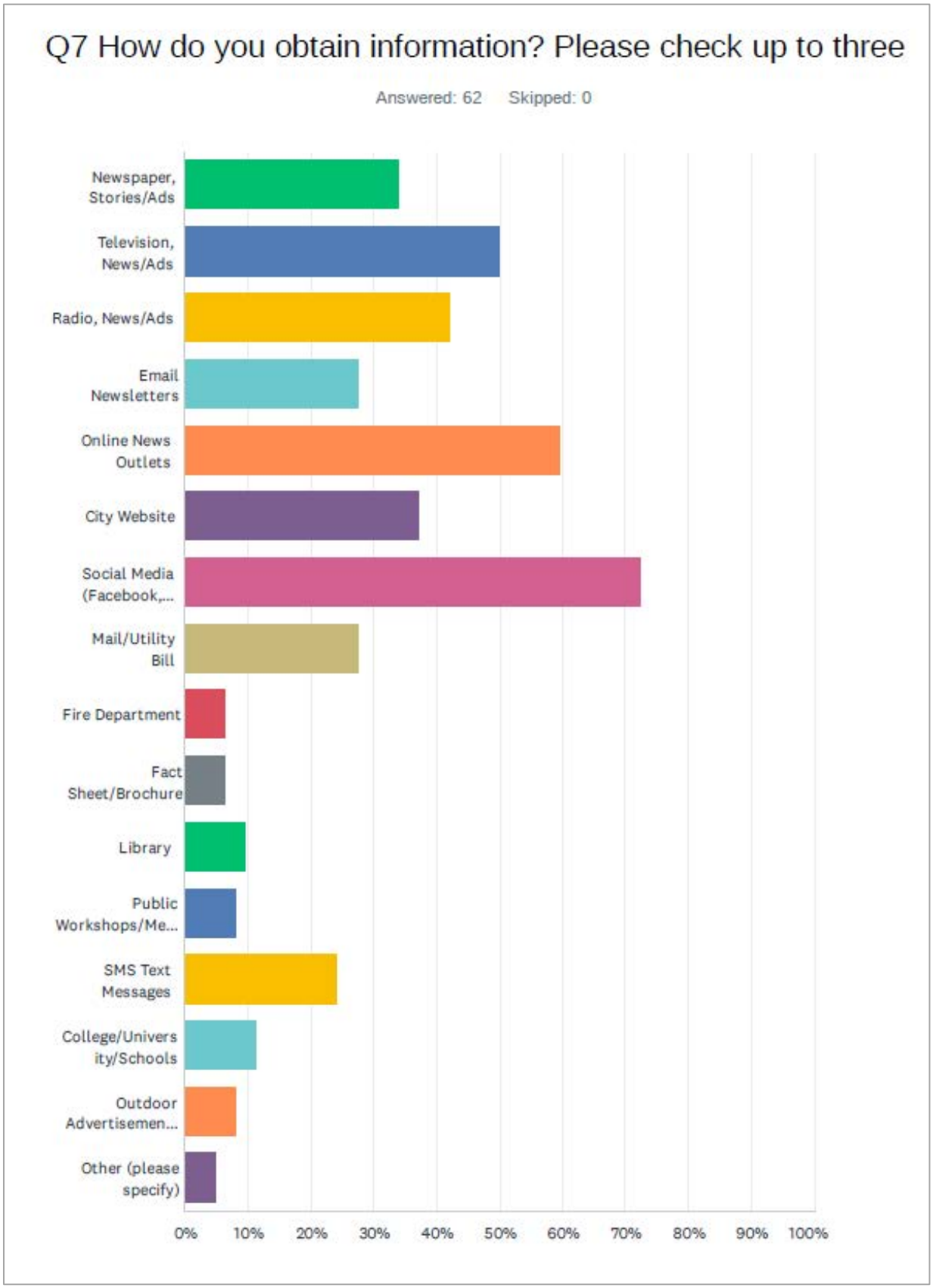
6. **If "YES"**, which of these natural disasters have you or someone in your household experienced in the past five years? (**Please check all that apply**)

☐ Earthquake
☐ Floods, Dam Failure and Inundation Hazards
☐ Wildfire Hazards/Brush Fire
☐ Climate Change
☐ Severe Windstorm
☐ Landslide
☐ Pandemic



7. How do you get information? (**Please check up to three**)

☐ Newspaper stories/ads
☐ Television news/ads
☐ Radio News/ads
Internet:
☐ Email newsletters
☐ Online news outlets
☐ City web site
☐ Social media (e.g. Facebook, Twitter, Instagram, etc.)
☐ Mail/Utility Bill
☐ Fire Department
☐ Fact sheet/Brochure
☐ Library
☐ Public workshops/Meetings
☐ SMS text message
☐ College/University/Schools
☐ Outdoor advertisements (billboards)
☐ Other: _____


Q7 How do you obtain information? Please check up to three
Answered: 62 Skipped: 0
Newspaper, Stories/Ads
Television, News/Ads
Radio, News/Ads
Email Newsletters
Online News Outlets
City Website
Social Media (Facebook,...
Mail/Utility Bill
Fire Department
Fact Sheet/Brochure
Library
Public Workshops/Me...
SMS Text Messages
College/University/Schools
Outdoor Advertisemen...
Other (please specify)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

#	OTHER (PLEASE SPECIFY)	DATE
1	Nixle	12/18/2021 11:21 AM
2	Nextdoor.com	7/15/2021 10:48 AM
3	People in the community reach out to me for information and to place their articles and ads in our paper to help get the word out.	7/15/2021 10:29 AM

8. How concerned are you about the following hazards?

Natural Disaster	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned
Climate Change	☐	☐	☐	☐	☐
Severe Windstorm	☐	☐	☐	☐	☐
Flood, Dam Failure and Inundation Hazards	☐	☐	☐	☐	☐
Wildfire Hazards/Brush Fire	☐	☐	☐	☐	☐
Landslides	☐	☐	☐	☐	☐
Pandemic	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐

2021 Pomona Local Hazard Mitigation Plan Update Survey

	NOT CONCERNED	NOT VERY CONCERNED	NEUTRAL	SOMEWHAT CONCERNED	VERY CONCERNED	TOTAL
Climate Change	1.61% 1	1.61% 1	8.06% 5	17.74% 11	70.97% 44	62
Severe Windstorm	11.67% 7	8.33% 5	35.00% 21	26.67% 16	18.33% 11	60
Flood, Dam Failure and Inundation Hazards	11.29% 7	11.29% 7	40.32% 25	19.35% 12	17.74% 11	62
Wildfire Hazards/Brush Fire	1.64% 1	3.28% 2	14.75% 9	37.70% 23	42.62% 26	61
Landslides	13.33% 8	20.00% 12	35.00% 21	21.67% 13	10.00% 6	60
Pandemic	1.64% 1	6.56% 4	13.11% 8	24.59% 15	54.10% 33	61
Earthquake	0.00% 0	1.64% 1	6.56% 4	36.07% 22	55.74% 34	61

9. Planning ahead for responding to disasters can help lessen their impact. To help the City prioritize its disaster preparedness efforts, please tell us how important each of the following goals is to you.

Goal	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐
Protecting critical facilities (hospitals, fire stations, etc.)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting the natural environment	☐	☐	☐	☐	☐
Protecting historical/cultural landmarks, museums, etc.	☐	☐	☐	☐	☐
Promoting cooperation among public and private organizations and citizens	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities	☐	☐	☐	☐	☐
Strengthening emergency services (police, fire, ambulance)	☐	☐	☐	☐	☐
Protecting major employers	☐	☐	☐	☐	☐
Protecting small businesses	☐	☐	☐	☐	☐
Protecting K-12 schools	☐	☐	☐	☐	☐
Protecting Colleges/Universities	☐	☐	☐	☐	☐

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Protecting Private Property	1.64% 1	3.28% 2	4.92% 3	16.39% 10	73.77% 45	61
Protecting Critical Facilities (hospitals, fire stations, etc.)	1.67% 1	1.67% 1	0.00% 0	8.33% 5	88.33% 53	60
Preventing Development in Hazard Areas	4.92% 3	1.64% 1	6.56% 4	29.51% 18	57.38% 35	61
Protecting the Natural Environment	1.67% 1	1.67% 1	6.67% 4	25.00% 15	65.00% 39	60
Protecting Historical/Cultural Landmarks, Museums, etc.	4.92% 3	4.92% 3	16.39% 10	36.07% 22	37.70% 23	61
Promoting Cooperation among Public and Private Organizations and Citizens	3.28% 2	1.64% 1	14.75% 9	21.31% 13	59.02% 36	61
Protecting and Reducing Damage to Utilities	1.64% 1	1.64% 1	1.64% 1	14.75% 9	80.33% 49	61
Strengthening Emergency Services (police, fire, ambulance, etc.)	1.64% 1	1.64% 1	1.64% 1	19.67% 12	75.41% 46	61
Protecting Major Employers	3.28% 2	6.56% 4	39.34% 24	26.23% 16	24.59% 15	61
Protecting Small Businesses	3.28% 2	3.28% 2	21.31% 13	26.23% 16	45.90% 28	61
Protecting K-12 schools	1.67% 1	1.67% 1	20.00% 12	15.00% 9	61.67% 37	60
Protecting Colleges/Universities	3.39% 2	6.78% 4	23.73% 14	18.64% 11	47.46% 28	59

10. Community assets are features, characteristics, or resources that either make a community unique or allow the community to function. Please rank the importance of protecting the following community assets:

Community Assets: **Potential Disaster Impact**	**Very Important**	**Somewhat Important**	**Neutral**	**Not Very Important**	**Not Important**
Human**:** Loss of life and/or injuries	☐	☐	☐	☐	☐
Economic**:** Business closures and/or job losses	☐	☐	☐	☐	☐
Infrastructure**:** Damage or loss of bridges, utilities, schools, etc.	☐	☐	☐	☐	☐
Cultural Historic**:** Damage or loss of libraries, museums, fairgrounds, etc.	☐	☐	☐	☐	☐
Environmental**:** Damage or loss of forests, rangeland, waterways, etc.	☐	☐	☐	☐	☐
Governance**:** Ability to maintain order and/or provide public amenities and services	☐	☐	☐	☐	☐

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Human: Loss of Life and/or Injuries	0.00% 0	1.61% 1	1.61% 1	6.45% 4	90.32% 56	62
Economic: Business Closures and/or Job Losses	1.61% 1	0.00% 0	12.90% 8	29.03% 18	56.45% 35	62
Infrastructure: Damage or Loss of Bridges, Utilities, Schools, etc.	1.61% 1	1.61% 1	3.23% 2	17.74% 11	75.81% 47	62
Cultural Historic: Damage or Loss of Libraries, Museums, Fairgrounds, etc.	3.23% 2	4.84% 3	27.42% 17	22.58% 14	41.94% 26	62
Environmental: Damage or Loss of Forests, Rangeland, Waterways, etc.	1.61% 1	3.23% 2	9.68% 6	25.81% 16	59.68% 37	62
Governance: Ability to Maintain Order and/or Provide Public Amenities and Services	1.64% 1	1.64% 1	6.56% 4	13.11% 8	77.05% 47	61

11. Have you taken any of the following steps to prepare for your household for potential disasters? Check all that apply.

☐ Purchased homeowners/renters insurance
☐ Purchased flood insurance

☐ Floodproofing (elevating furnace, water heaters, electric panels
☐ Installed retrofits such as high impact windows or doors to withstand high winds; fire resistant siding roofing or window

☐ Attended meetings or received written information on natural disasters or emergency preparedness
☐ Talked with family members about what to do in case of a disaster or emergency
☐ Developed a “Household/Family Emergency Plan” in order to decide what everyone would do in the event of a disaster

screens, etc.
☐ Installed/maintained firebreaks around the home

☐ Prepared a "Disaster Supply Kit" (extra food, water, batteries, medications, first aid, etc.)

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Human: Loss of Life and/or Injuries	0.00% 0	1.61% 1	1.61% 1	6.45% 4	90.32% 56	62
Economic: Business Closures and/or Job Losses	1.61% 1	0.00% 0	12.90% 8	29.03% 18	56.45% 35	62
Infrastructure: Damage or Loss of Bridges, Utilities, Schools, etc.	1.61% 1	1.61% 1	3.23% 2	17.74% 11	75.81% 47	62
Cultural Historic: Damage or Loss of Libraries, Museums, Fairgrounds, etc.	3.23% 2	4.84% 3	27.42% 17	22.58% 14	41.94% 26	62
Environmental: Damage or Loss of Forests, Rangeland, Waterways, etc.	1.61% 1	3.23% 2	9.68% 6	25.81% 16	59.68% 37	62
Governance: Ability to Maintain Order and/or Provide Public Amenities and Services	1.64% 1	1.64% 1	6.56% 4	13.11% 8	77.05% 47	61

12. How would you rank the following strategies to address pre- and post-disaster damage?

Strategy	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Retrofit and strengthen essential facilities such as police, fire, emergency medical services, hospitals, schools, etc.	☐	☐	☐	☐	☐
Replace inadequate or vulnerable bridges and causeways	☐	☐	☐	☐	☐
Install or improve protective structures, such as floodwalls or levees	☐	☐	☐	☐	☐
Government buys flood-prone properties and returns them to a natural condition	☐	☐	☐	☐	☐
Assist property owners with securing funding to mitigate impacts to their property caused by disasters	☐	☐	☐	☐	☐
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities, etc.	☐	☐	☐	☐	☐

Strengthen City codes, ordinances, and plans to require high risk management standards	☐	☐	☐	☐	☒
Provide better information about hazard risk and high-hazard areas	☐	☐	☐	☐	☐
Inform property owners of ways they can prevent damage to their properties	☐	☐	☐	☐	☐

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Retrofit and strengthen essential facilities such as police, fire, emeegency medical services, hospitals, schools, etc.	1.61% 1	3.23% 2	6.45% 4	24.19% 15	64.52% 40	62
Replace inadequate or vulnerable bridges and causeways	1.61% 1	1.61% 1	3.23% 2	24.19% 15	69.35% 43	62
Install or improve protective structures, such as floodwalls or levees	6.45% 4	6.45% 4	16.13% 10	27.42% 17	43.55% 27	62
Government buys flood-prone properties and returns them to a natural condition	8.06% 5	8.06% 5	30.65% 19	24.19% 15	29.03% 18	62
Assist property owners with securing funding to mitigate impacts to their property caused by disasters	0.00% 0	3.23% 2	14.52% 9	20.97% 13	61.29% 38	62
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities, etc.)	1.61% 1	1.61% 1	4.84% 3	22.58% 14	69.35% 43	62
Strengthen City codes, ordinances, and plans to require high risk management standards	1.64% 1	6.56% 4	19.67% 12	22.95% 14	49.18% 30	61
Provide better information about hazard risk and high-hazard areas	0.00% 0	1.64% 1	8.20% 5	31.15% 19	59.02% 36	61
Inform property owners of ways they can prevent damage to their properties	0.00% 0	1.61% 1	4.84% 3	24.19% 15	69.35% 43	62

13. Please feel free to provide any additional comments:

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Neighborhood Services
January 27, 2022

1. Discuss outstanding questions:
    - A. List of transitional housing and senior care facilities
    - B. Information about Housing Division rental and mortgage assistance, housing and rehab and façade improvement programs
    - C. List of community centers and City Parks
    - D. YMCA

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Landslide prevention (5.6) - Community Services?
    - B. Stabilizing Ganesha Park slopes (5.8) - Community Services?
    - C. Vulnerable population services (6.2) - New; this was added to the pandemic section of the update

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Projects already planned for—studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Water Resources
February 3, 2022

1. Discuss outstanding questions:
    - A. Retrofits since last HMP update
    - B. Mitigations implemented following 2003 report regarding structural stability of city reservoirs
    - C. City ground water wells
    - D. City reservoirs, and retrofits

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Implementation options for hazard mitigation (1.2)
    - B. Water reservoir seismic retrofit completion (2.5)
    - C. Aging water and sewer infrastructure replacement (2.6)
    - D. City employee protection (2.9) - New; added for new pandemic section
    - E. Landslide prevention (5.6)

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Projects already planned for studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Public Works
February 3, 2022

1. Discuss outstanding questions:
    - A. Retrofits since last HMP update
    - B. Mitigations implemented following 2003 Ganesha Park landslide report
    - C. Wastewater diverted to JWPCP in Carson
    - D. Areas of flood concern

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Implementation options for hazard mitigation (1.2)
    - B. Establish "Lifeline" circulation system (2.4)
    - C. Localized flood control improvements (2.7)
    - D. City employee protection (2.9) - New; added for new pandemic section
    - E. Landslide prevention (5.6)

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Completion of Goldline
    - B. Public Works/CIP projects already planned for studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Water Resources
February 7, 2022

1. Discuss outstanding questions:
    - A. Copy of SEMS Plan

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Mitigation Actions under outside agency authority (2.8 & 4.2)
        - 1) Back-up medical services (2.8)
        - 2) Community emergency volunteers
    - B. Coordinator and LHMP committee (1.1)
    - C. Integrity of emergency operation center system (2.1)
    - D. Back-up emergency operations center (2.2)
    - E. Hazard mitigation partners (4.3)
    - F. Pomona SEMS Plan (8.1)
    - G. Emergency preparedness drills (8.2)
    - H. Decentralized emergency supplies and equipment (8.3)
    - I. City Hall life safety planning (8.4)

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Projects already planned for studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Development Services
February 14, 2022

1. Discuss outstanding questions:
   - A. URM buildings in the City
   - B. URM City owned facilities
   - C. List of Historic Resources
   - D. Housing Element—overcrowded neighborhoods and soft-story multi-family housing
   - E. Safety Element update pursuant to SB 99 and AB 747
   - F. Housing vs population growth number, percent of housing types, and vacancy rates
   - G. Properties on National Register of Historic Places, Historic Landmarks, Pomona's Landmark Register
   - H. Percent of City located in liquefaction zones
   - I. Construction date of facilities used during emergencies

2. Discuss mitigation actions from previous Hazard Mitigation Plan
   - A. Implementation options for hazard mitigation (1.2)
   - B. Reinforcement of other City facilities (2.3)
   - C. Establish "Lifeline" circulation system (2.4)
   - D. Unreinforced masonry buildings (5.1)
   - E. Vulnerable buildings reinforced (5.2)
   - F. Valuing heritage (5.3)
   - G. Reduce wildfire threat (5.4)
   - H. Expanded Code Enforcement in overcrowded neighborhoods (5.5)
   - I. Landslide prevention development standards (5.7)
   - J. Business community protection (5.9); New, added for pandemic hazards
   - K. General Plan and Development Code update (7.1)
   - L. Development project review for natural hazards risks (7.2)

3. Discuss any new mitigation actions that should be included in update.

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Police Department
March 7, 2022

1. Discuss mitigation actions from previous Hazard Mitigation Plan
   A. Early Warning Systems and Local Consideration (3.1)
   B. Emergency Preparedness Campaigns (4.1)
   C. Accelerated Emergency Response for Vulnerable Populations (6.1)

2. Discuss any new mitigation actions that should be included in update.

Appendix B:

HAZUS Report





FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name:	Pomona
Earthquake Scenario:	M6.7-San Jose v10
Print Date:	May 28, 2021

Disclaimer:
This version of Hazus utilizes 2010 Census Data
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

HAZUS FEMA

Table of Contents

Section	Page #
General Description of the Region	3
Building and Lifeline Inventory	4
Building Inventory	
Critical Facility Inventory	
Transportation and Utility Lifeline Inventory	
Earthquake Scenario Parameters	7
Direct Earthquake Damage	8
Buildings Damage	
Essential Facilities Damage	
Transportation and Utility Lifeline Damage	
Induced Earthquake Damage	14
Fire Following Earthquake	
Debris Generation	
Social Impact	15
Shelter Requirements	
Casualties	
Economic Loss	17
Building Related Losses	
Transportation and Utility Lifeline Losses	

Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 21.91 square miles and contains 30 census tracts. There are over 38 thousand households in the region which has a total population of 150,369 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 33 thousand buildings in the region with a total building replacement value (excluding contents) of 12,985 (millions of dollars). Approximately 93.00 % of the buildings (and 75.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,147 and 562 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 33 thousand buildings in the region which have an aggregate total replacement value of 12,985 (millions of dollars). Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 555 beds. There are 50 schools, 8 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 6 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,709.00 (millions of dollars). This inventory includes over 108.12 miles of highways, 67 bridges, 1,121.57 miles of pipes.

Table 1: Transportation System Lifeline Inventory

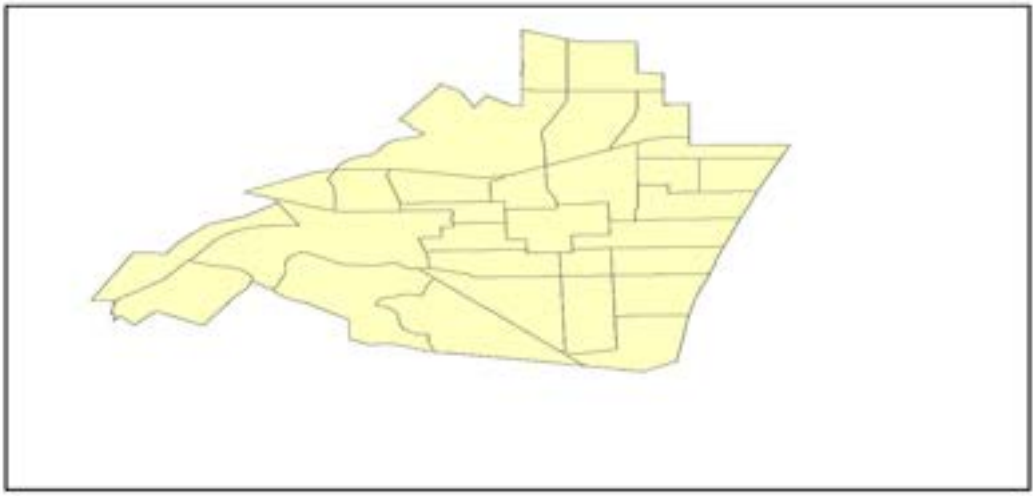
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	67	460.9871
	Segments	113	1454.3228
	Tunnels	0	0.0000
	Subtotal		**1915.3099**
Railways	Bridges	7	40.0448
	Facilities	2	5.3260
	Segments	64	114.5125
	Tunnels	0	0.0000
	Subtotal		**159.8833**
Light Rail	Bridges	0	0.0000
	Facilities	2	7.3224
	Segments	4	50.5316
	Tunnels	0	0.0000
	Subtotal		**57.8540**
Bus	Facilities	0	0.0000
	Subtotal		**0.0000**
Ferry	Facilities	0	0.0000
	Subtotal		**0.0000**
Port	Facilities	0	0.0000
	Subtotal		**0.0000**
Airport	Facilities	1	14.4161
	Runways	0	0.0000
	Subtotal		**14.4161**
	Total		**2,147.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	18.0546
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**18.0546**
Waste Water	Distribution Lines	NA	10.8328
	Facilities	2	327.2234
	Pipelines	0	0.0000
		Subtotal	**338.0562**
Natural Gas	Distribution Lines	NA	7.2218
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**7.2218**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	199.0800
		Subtotal	**199.0800**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**562.40**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	M6.7-San Jose v10
Type of Earthquake	
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	0.00
Latitude of Epicenter	0.00
Earthquake Magnitude	6.66
Depth (km)	0.00
Rupture Length (Km)	0.00
Rupture Orientation (degrees)	0.00
Attenuation Function	

Direct Earthquake Damage

Building Damage

Hazus estimates that about 11,492 buildings will be at least moderately damaged. This is over 34.00 % of the buildings in the region. There are an estimated 899 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

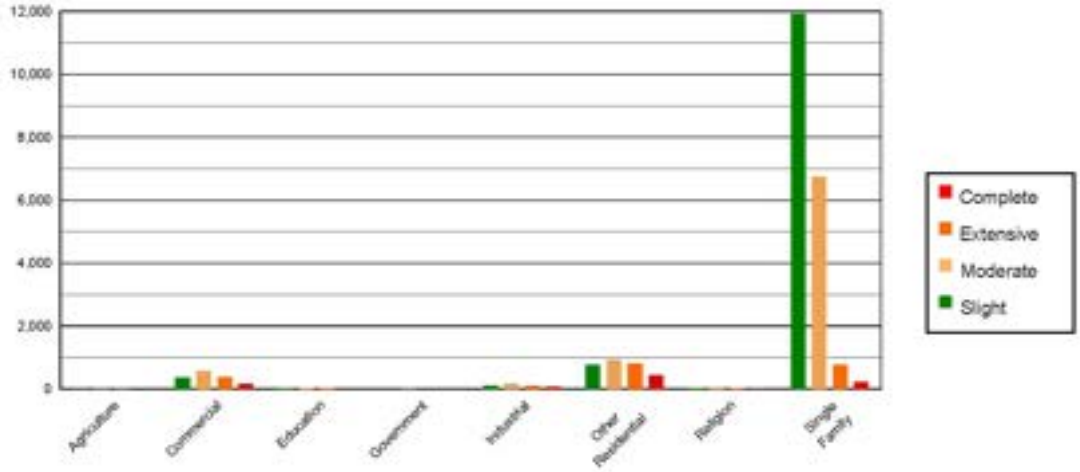


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.29	0.06	10.73	0.08	11.67	0.14	6.10	0.29	3.01	0.33
Commercial	238.98	2.77	360.95	2.73	566.60	6.67	365.56	17.39	162.91	18.10
Education	18.99	0.22	24.78	0.19	27.19	0.32	13.38	0.64	4.66	0.52
Government	2.37	0.03	3.52	0.03	5.50	0.06	3.86	0.18	1.75	0.19
Industrial	60.74	0.71	93.99	0.71	164.91	1.94	113.17	5.38	54.19	6.02
Other Residential	452.06	5.25	768.73	5.81	925.52	10.90	798.66	38.00	447.04	49.68
Religion	24.94	0.29	35.75	0.27	44.41	0.52	27.58	1.31	12.32	1.37
Single Family	7807.31	90.65	11926.17	90.18	6745.15	79.44	773.37	36.80	213.99	23.78
Total	**8,613**		**13,225**		**8,491**		**2,102**		**900**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	8205.55	95.27	12605.14	95.32	7130.26	83.97	800.43	38.09	231.46	25.72
Steel	62.62	0.73	90.96	0.69	200.70	2.36	155.27	7.39	68.88	7.65
Concrete	80.75	0.94	130.03	0.98	164.70	1.94	111.84	5.32	50.49	5.61
Precast	52.55	0.61	87.55	0.66	179.38	2.11	126.32	6.01	55.88	6.21
RM	181.73	2.11	176.17	1.33	292.93	3.45	197.65	9.40	59.08	6.57
URM	10.74	0.12	22.89	0.17	48.54	0.57	39.45	1.88	35.68	3.96
MH	18.73	0.22	111.89	0.85	474.64	5.59	670.72	31.91	398.41	44.27
Total	8,613		13,225		8,491		2,102		900	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 555 hospital beds available for use. On the day of the earthquake, the model estimates that only 59 hospital beds (11.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 26.00% of the beds will be back in service. By 30 days, 63.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	3	0	0
Schools	50	43	0	0
EOCs	1	1	0	0
PoliceStations	2	2	0	0
FireStations	8	6	0	0

Transportation Lifeline Damage

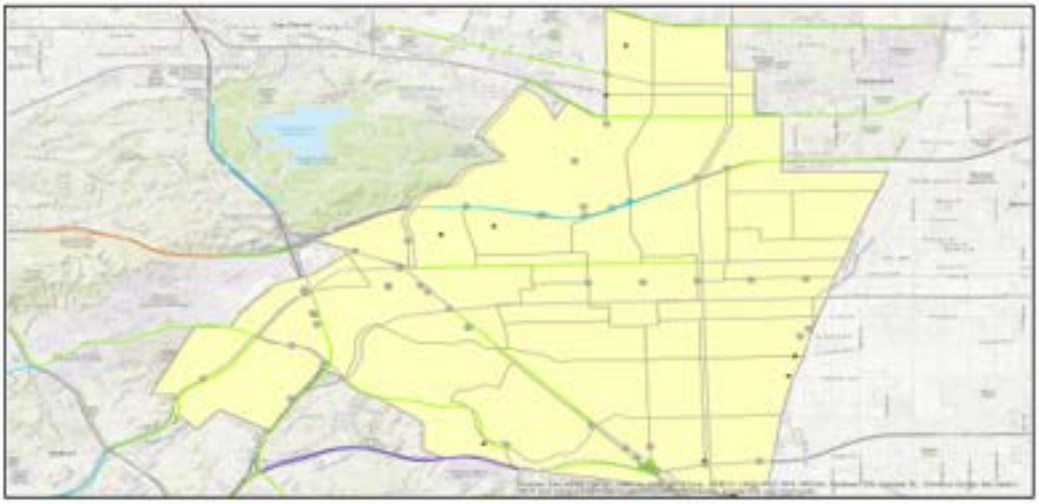


Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	113	0	0	113	113
	Bridges	67	5	0	62	65
	Tunnels	0	0	0	0	0
Railways	Segments	64	0	0	64	64
	Bridges	7	0	0	7	7
	Tunnels	0	0	0	0	0
	Facilities	2	2	0	2	2
Light Rail	Segments	4	0	0	3	3
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	2	2	0	2	2
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	1	0	1	1
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	2	2	0	0	2
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	1	0	0	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	581	520	130
Waste Water	337	261	65
Natural Gas	224	89	22
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	38,360	21,882	10,734	0	0	0
Electric Power		21,580	12,759	4,889	881	31

Induced Earthquake Damage

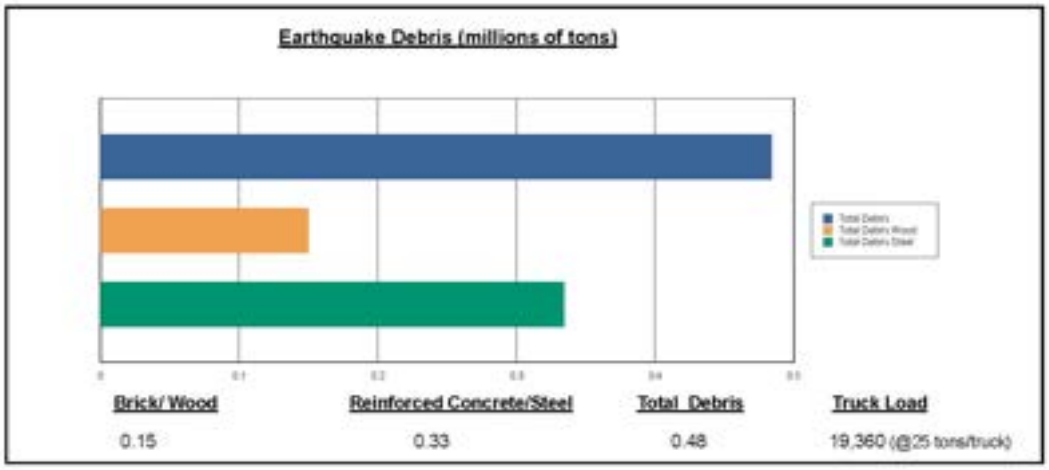
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 3 ignitions that will burn about 0.04 sq. mi 0.18 % of the region's total area.) The model also estimates that the fires will displace about 506 people and burn about 31 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 484,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 31.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 19,360 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

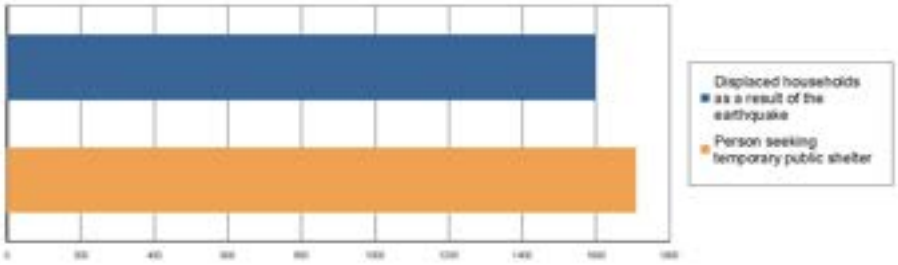


Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1,599 households to be displaced due to the earthquake. Of these, 1,708 people (out of a total population of 150,389) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1,599	1,708

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening.
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake.

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	10.60	3.03	0.49	0.96
	Commuting	0.03	0.07	0.08	0.02
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	20.04	5.48	0.83	1.64
	Other-Residential	221.85	63.32	6.12	11.60
	Single Family	165.69	24.49	1.21	2.10
	Total	**418**	**86**	**9**	**16**
2 PM	Commercial	640.02	179.18	28.92	56.83
	Commuting	0.30	0.59	0.76	0.16
	Educational	239.88	65.88	10.65	20.83
	Hotels	0.00	0.00	0.00	0.00
	Industrial	147.67	40.29	6.16	11.99
	Other-Residential	48.69	11.75	1.39	2.56
	Single Family	35.87	5.36	0.31	0.46
	Total	**1,112**	**303**	**48**	**93**
5 PM	Commercial	458.61	128.01	20.72	40.22
	Commuting	4.67	9.41	12.03	2.62
	Educational	23.33	6.44	1.05	2.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	92.29	25.18	3.85	7.49
	Other-Residential	83.22	20.07	2.37	4.38
	Single Family	64.27	9.60	0.56	0.81
	Total	**726**	**199**	**41**	**57**

Economic Loss

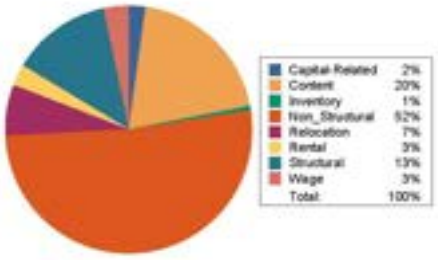
The total economic loss estimated for the earthquake is 2,487.94 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 2,278.18 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 51 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

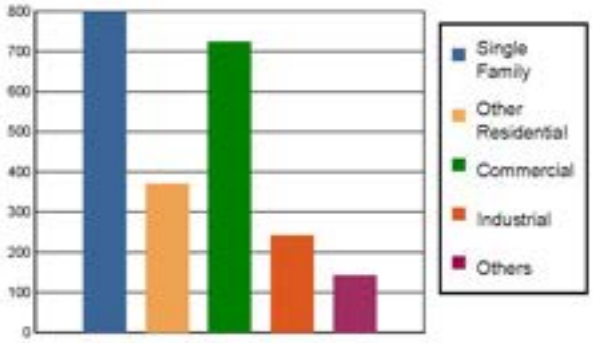


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.0557	66.2671	4.1600	3.4403	77.9231
	Capital-Related	0.0000	1.7220	47.3160	2.5948	1.3086	52.9414
	Rental	15.9428	17.0835	28.5176	1.5857	1.9733	65.1029
	Relocation	58.1384	14.7344	50.3301	7.3132	18.5282	149.0443
	Subtotal	**74.0812**	**37.5956**	**192.4308**	**15.6537**	**25.2504**	**345.0117**
Capital Stock Losses							
	Structural	96.9492	44.6101	105.5313	31.5851	16.9782	295.6539
	Non_Structural	480.5309	234.2282	284.3100	109.6361	67.8937	1,176.5989
	Content	147.7758	54.2318	137.6300	73.6736	32.4963	445.8075
	Inventory	0.0000	0.0000	4.2226	10.7916	0.0965	15.1107
	Subtotal	**725.2559**	**333.0701**	**531.6939**	**225.6864**	**117.4647**	**1933.1710**
	Total	**799.34**	**370.67**	**724.12**	**241.34**	**142.72**	**2278.18**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1454.3228	0.0000	0.00
	Bridges	460.9871	32.2888	7.00
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1915.3099**	**32.2888**	
Railways	Segments	114.5125	0.0000	0.00
	Bridges	40.0448	2.8890	7.21
	Tunnels	0.0000	0.0000	0.00
	Facilities	5.3260	2.2704	42.63
	Subtotal	**159.8833**	**5.1594**	
Light Rail	Segments	50.5316	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	7.3224	3.1301	42.75
	Subtotal	**57.8540**	**3.1301**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	14.4161	5.7830	40.11
	Runways	0.0000	0.0000	0.00
	Subtotal	**14.4161**	**5.7830**	
	Total	**2,147.46**	**46.36**	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	18.0546	2.3395	12.96
	Subtotal	**18.0546**	**2.3395**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	327.2234	98.0345	29.96
	Distribution Lines	10.8328	1.1752	10.85
	Subtotal	**338.0562**	**99.2097**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	7.2218	0.4026	5.57
	Subtotal	**7.2218**	**0.4026**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	199.0800	61.4431	30.86
	Subtotal	**199.0800**	**61.4431**	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
	Total	**562.41**	**163.39**	





Appendix A: County Listing for the Region

Los Angeles,CA

HAZUS FEMA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Los Angeles	150,389	9,731	3,254	12,985
Total Region		**150,389**	**9,731**	**3,254**	**12,985**

Appendix C:

Resource Directory &

Pomona Organizational Charts

APPENDIX C: RESOURCE DIRECTORY

The Resource Directory, provided by the Disaster Management Area D Coordinator, provides contact information for local, regional, state, and federal programs that are currently involved in hazard mitigation activities. The Hazard Mitigation Action Committee may refer to the organizations on the following pages for resources and technical assistance. The Resource Directory provides a foundation for potential partners in action item implementation.

American Public Works Association

Level: National
Hazard: Multi
http://www.apwa.net
2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2641
Ph: 816.472.1610

Notes: The American Public Works Association is an international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.

Association of State Floodplain Manager

Level: Federal
Hazard: Flood
www.floods.org
2809 Fish Hatchery Road, Madison WI 53713
Ph: 608.274.0123

Notes: The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery

Building Seismic Safety Council (BSSC)

Level: National
Hazard: Earthquake
www.bssconline.org
1090 Vermont Avenue NW, Suite 700, Washington DC, 20005
Ph: 202.289.7800

Notes: The Building Seismic Safety Council (BSSC) develops and promotes building earthquake risk mitigation regulatory provisions for the nation.

California Department of Transportation (Cal-Trans)

Level: State
Hazard: Multi
http://www.dot.ca.gov/
120 S. Spring Street, Los Angeles, CA 90012
Ph: 213.897.3656

Notes: CalTrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries. Alone and in partnership with Amtrak, Caltrans is also involved in the support of intercity passenger rail service in California.

California Resources Agency

Level: State
Hazard: Multi
http://resources.ca.gov/
1416 Ninth Street, Suite 1331, Sacramento, CA 95814
Ph: 916.653.5656

Notes: The California Resources Agency restores, protects and manages the state's natural, historical and cultural resources for current and future generations using solutions based on science, collaboration and respect for all the communities and interests involved.

California Division of Forestry (CDF)

Level: State
Hazard: Multi
http://www.fire.ca.gov/php/index.php
210 W. San Jacinto, Perris, CA 92570
Ph: 909.940.6900

Notes: The California Department of Forestry and Fire Protection protects over 31 million acres of California's privately-owned wildlands. CDF emphasizes the management and protection of California's natural resources.

California Division of Mines and Geology (DMG)

Level: State
Hazard: Multi
www.consrv.ca.gov/cgs/index.htm
801 K Street, MS 12-30, Sacramento, CA 95814
Ph: 916.445.1825

Notes: The California Geological Survey devel-ops and disseminates technical information and advice on California's geology, geologic hazards, and mineral resources.

California Environmental Resources Evaluation System (CERES)

Level: State
Hazard: Multi
http://ceres.ca.gov/
900 N. Street, Suite 250, Sacramento, CA 95814
Ph: 916.653.2238

Notes: CERES is an excellent website for access to environmental information and websites.

California Department of Water Resources (DWR)

Level: State
Hazard: Flood
http://www.dwr.water.ca.gov
1416 9th Street, Sacramento, CA 95814

Ph: 916.653.6192

Notes: The Department of Water Resources manages the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

California Department of Conservation: Southern California Regional Office

Level: State
Hazard: Multi
www.consrv.ca.gov
655 S. Hope Street, #700, Los Angeles, CA 90017-2321
Ph: 213.239.0878

Notes: The Department of Conservation provides services and information that promote environmental health, economic vitality, informed land-use decisions and sound management of our state's natural resources.

EPA, Region 9

Level: Regional
Hazard: Multi
http://epa.gov/region09
75 Hawthorne Street, San Francisco, CA 94105
Ph: 415.947.8000

Notes: The mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment through the themes of air and global climate change, water, land, communities and ecosystems, and compliance and environmental stewardship.

Federal Emergency Management Agency, Region IX

Level: Federal
Hazard: Multi
www.fema.gov
1111 Broadway, Suite 1200, Oakland, CA 94607
Ph: 510.627.7100

Notes: The Federal Emergency Management Agency is tasked with responding to, planning for, recovering from and mitigating against disasters.

Federal Emergency Management Agency, Mitigation Division

Level: Federal
Hazard: Multi
www.fema.gov/fima/planhowto.shtm
500 C. Street, SQ, Washington, DC 20472
Ph: 202.566.1600

Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance, Prevention, with mitigation measures and Partnerships, with communities throughout the country.

Floodplain Management Association

Level: Federal
Hazard: Flood
www.floodplain.org
P.O. Box 50891, Sparks, NV 89435-0891
Ph: 775.626.6389

Notes: The Floodplain Management Association is a nonprofit educational association. It was established in 1990 to promote the reduction of flood losses and to encourage the protection and enhancement of natural floodplain values. Members include representatives of federal, state and local government agencies as well as private firms.

Gateway Cities Partnership

Level: Regional
Hazard: Multi
www.gatewaycities.org
7300 Alondra Blvd., Suite 202, Paramount, CA 90723
Ph: 562.817.0820

Notes: Gateway Cities Partnership is a 501-C3 non-profit Community Development Corporation for the Gateway Cities region of southeast LA County. The region comprises 27 cities that roughly speaking extends from Montebello on the north to Long Beach on the South, the Alameda Corridor on the west to the Orange County line on the east.

Governor's Office of Emergency Services (OES)

Level: State
Hazard: Multi
www .oes.ca.gov
P.O. Box 419047, Rancho Cordova, CA 95741-9047
Ph: 916.845.8911

Notes: The Governor's Office of Emergency Services coordinates overall state agency response to major disasters in support of local government. The office is responsible for assuring the state's readiness to respond to and recover from natural, manmade, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts.

Governor's Office of Planning and Research

Level: State
Hazard: Multi
https://www.opr.ca.gov/about/contact-us.html
1400 Tenth Street, Sacramento, CA 95814
Ph: 916.322.2318

Notes: The Governor's Office of Planning and Research studies future research and planning needs, fosters goal-driven collaboration, and delivers guidance to state partners and local communities, with a focus on land use and community development, climate risk and resilience, and high road economic development.

Landslide Hazards Program, USGS

Level: Federal
Hazard: Landslide
http:// lands I ides.usgs.gov/index.htmI

12201 Sunrise Valley Drive, Reston, VA 20192
Ph: 703.648.4000

Notes: The NLIC website provides good information on the rograms and resources regarding landslides. The page includes information on the National Landslide Hazards Program Information Center, a bibliography, publications, and current projects. USGS scientists are working to reduce long-term losses and casualties from landslide hazards through better understanding of the causes and mechanisms of ground failure both nationally and worldwide.

Los Angeles County Economic Development Corporation

Level: Regional
Hazard: Multi
www.laedc.org
444 S. Flower Street, Los Angeles, CA 90071
Ph: 213.236.4813

Notes: The LAEDC is a private, non-profit 501 (c) 3 organization established in 1981 with the mission to attract, retain and grow businesses and jobs in the Los Angeles region. The LAEDC is widely relied upon for its Southern California Economic Forecasts and Industry Trend Reports. Lead by the renowned Jack Kyser (Sr. Vice President, Chief Economist) his team of re-searchers produces numerous publications to help business, media and government navigate the LA region's diverse economy.

Los Angeles County Public Works Department

Level: County
Hazard: Multi
http://ladpw.org
900 S. Fremont Ave., Alhambra, CA 91803
Ph: 626.458.5100

Notes: The Los Angeles County Department of Public Works protects property and promotes public safety through Flood Control, Water Conservation, Road Maintenance, Bridges, Buses and Bicycle Trails, Building and Safety, Land Development, Waterworks, Sewers, Engineering, Capital Projects and Airports.

National Wildland/Urban Interface Fire Program

Level: Federal
Hazard: Wildfire
www.firewise.org/
1 Batterymarch Park, Quincy, MA 02169-7471
Ph: 617.770.3000

Notes: Firewise maintains a Website designed for people who live in wildfire-prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.

National Resources Conservation Service

Level: Federal
Hazard: Multi
http://www.nrcs.usda.gov/
14th and Independ-ence Ave., SW, Washington, DC 20250
Ph: 202.720.7246

Notes: NRCS assists owners of America's private land with conserving their soil, water, and other natural resources, by delivering technical assistance based on sound science and suited to a customer's specific needs. Cost shares and financial incentives are available in some cases.

National lnteragency Fire Center (NIFC)

Level: Federal
Hazard: Wildfire
www.nifc.gov
3833 S. Development Ave., Boise, Idaho 83705-5354
Ph: 208.387.5512

Notes: The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations.

National Fire Protection Association (NFPA)

Level: National

Hazard: Wildfire
http://www.nfpa.org/catalog/home/index.asp
1 Batterymarch Park, Quincy, MA 02 I 69-7471
Ph: 617.770.3000

Notes: The mission of the international non-profit NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically based consensus codes and standards, research, training and education.

National Floodplain Insurance Program (NFIP)

Level: Federal
Hazard: Flood
www.fema.gov/nfip/
500 C Street, S. W., Washington, O.C. 20472
Ph: 202.566.1600

Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance, Prevention, with mitigation measures and Partnerships, with communities throughout the country.

National Oceanic /Atmospheric Administration

Level: Federal
Hazard: Multi
www.noaa.gov
14th Street & Constitution Ave NW, Washington, DC 20230
Ph: 202.482.6090

Notes: NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.

National Weather Service, Office of Hydrologic Development

Level: Federal
Hazard: Flood
http://www.nws.noaa.gov/

1325 East West Highway, SSMC2, Silver Spring, MD 20910
Ph: 301.713.1658

Notes: The Office of Hydrologic Development (OHO) enhances National Weather Service products by infusing new hydrologic science, developing hydrologic techniques for operational use, managing hydrologic development by NWS field office, providing advanced hydrologic products to meet needs identified by NWS customers.

National Weather Service

Level: Federal
Hazard: Multi
http://www.nws.noaa.gov/
520 North Elevar Street, Oxnard, CA 93030
Ph: 805.988.6615

Notes: The National Weather Service is responsible for providing weather service to the nation. It is charged with the responsibility of observing and reporting the weather and with issuing forecasts and warnings of weather and floods in the interest of national safety and economy. Briefly, the priorities for service to the nation are: 1. protection of life, 2. protection of property, and 3. promotion of the nation's welfare and economy.

San Gabriel Valley Economic Partnership

Level: Regional
Hazard: Multi
www.valleynet.org
4900 Rivergrade Road, Irwindale, CA 91706
Ph: 626.856.3400

Notes: The San Gabriel Valley Economic Partnership is a non-profit corporation representing both public and private sectors. The Partnership is the exclusive source for San Gabriel Valley specific information, expertise, consulting, products, services, and events. It is the single organization in the Valley with the mission to sustain and build the regional economy for the mutual benefit of all thirty cities, chambers of commerce, academic institutions, businesses, and residents.

Sanitation Districts of Los Angeles County

Level: County
Hazard: Flood
http://www.lacsd.ora/
1955 Workman Mill Road, Whittier, CA 90607
Ph: 562.699.7411 x 2301

Notes: The South Bay Economic Development Partnership is a collaboration of business, labor, education and government. Its primary goal is to plan and implement an economic development and marketing strategy designed to retain and create jobs and stimulate economic growth in the South Bay of Los Angeles County.

South Coast Air Quality Management District (AQMD)

Level: Regional
Hazard: Multi
www.aqmd.gov
21865 E. Copley Drive, Diamond Bar, CA 91765
Ph: 800.CUT.SMOG

Notes: AQMD is a regional government agency that seeks to achieve and maintain healthful air quality through a comprehensive program of research, regulations, enforcement, and communication. The AQMD covers Los Angeles and Orange Counties and parts of Riverside and San Bernardino Counties.

Southern California Earthquake Center (SCEC)

Level: Regional
Hazard: Earthquake
www.scec.org
3651 Trousdale Parkway, Suite 169, Los Angeles, CA 90089-0742
Ph: 213.740.5843

Notes: The Southern California Earthquake Center (SCEC) gathers new information about earthquakes in Southern California, integrates this information into a comprehensive and predictive understanding of earthquake phenomena, and communicates this understanding to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives.

Southern California Association of Governments (SCAG)

Level: Regional
Hazard: Multi
www.scag.ca.gov
818 W. Seventh Street, 12th floor, Los Angeles, CA 90017
Ph: 213.236.1800

Notes: The Southern California Association of Governments functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.

State Fire Marshal (SFM)

Level: State
Hazard: Wildfire
http://osfm.fire.ca.gov
1131 "S" Street, Sacramento, CA 95814
Ph: 916.445.8200

Notes: The Office of the State Fire Marshal (SFM) supports the mission of the California Department of Forestry and Fire Protection (CDF) by focusing on fire prevention. SFM regulates buildings in which people live, controls substances which may, cause injuries, death and destruction by fire; provides statewide direction for fire prevention within wildland areas; regulates hazardous liquid pipelines; reviews regulations and building standards; and trains and educates in fire protection methods and responsibilities.

The Community Rating System (CRS)

Level: Federal
Hazard: Flood
http://www.fema.gov/nfip/crs.shtm
500 C Street, S. W., Washington, D.C. 20472
Ph: 202.566.1600

Notes: The Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimum requirements of the NFlP. Property owners within the County would receive reduced NFIP flood insurance premiums if the County implements floodplain management practices that qualify it for a CRS rating. For further information on the CRS, visit FEMA's website.

United States Geological Survey

Level: Federal
Hazard: Multi
http://www.usgs.gov/
345 Middlefield Road, Menlo Park, CA 94025
Ph: 650.853.8300

Notes: The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

US Army Corps of Engineers

Level: Federal
Hazard: Multi
http://www.usaace.army.mil
P.O. Box 532711, Los Angeles CA 90053- 2325
Ph: 213.452.3921

Notes: The United States Army Corps of Engineers work in engineering and environmental matters. A workforce of biologists, engineers, geologists, hydrologists, natural resource managers and other professionals provide engineering services to the nation including planning, designing, building and operating water resources and other civil works projects.

USDA Forest Service

Level: Federal
Hazard: Wildfire

http://www.fs.fed.us
1400 Independence Ave. SW, Washington, D.C. 20250-0002
Ph: 202.205.8333

Notes: The Forest Service is an agency of the U.S. Department of Agriculture. The Forest Service manages public lands in national forests and grasslands.

USGS Water Resources

Level: Federal
Hazard: Multi
www.water.usgs.gov
6000 J Street, Sacramento, CA 95819-6129
Ph: 916.278.3000

Notes: The USGS Water Resources mission is to provide water information that benefits the Nation's citizens: publications, data, maps, and applications software.

Western States Seismic Policy Council (WSSPC)

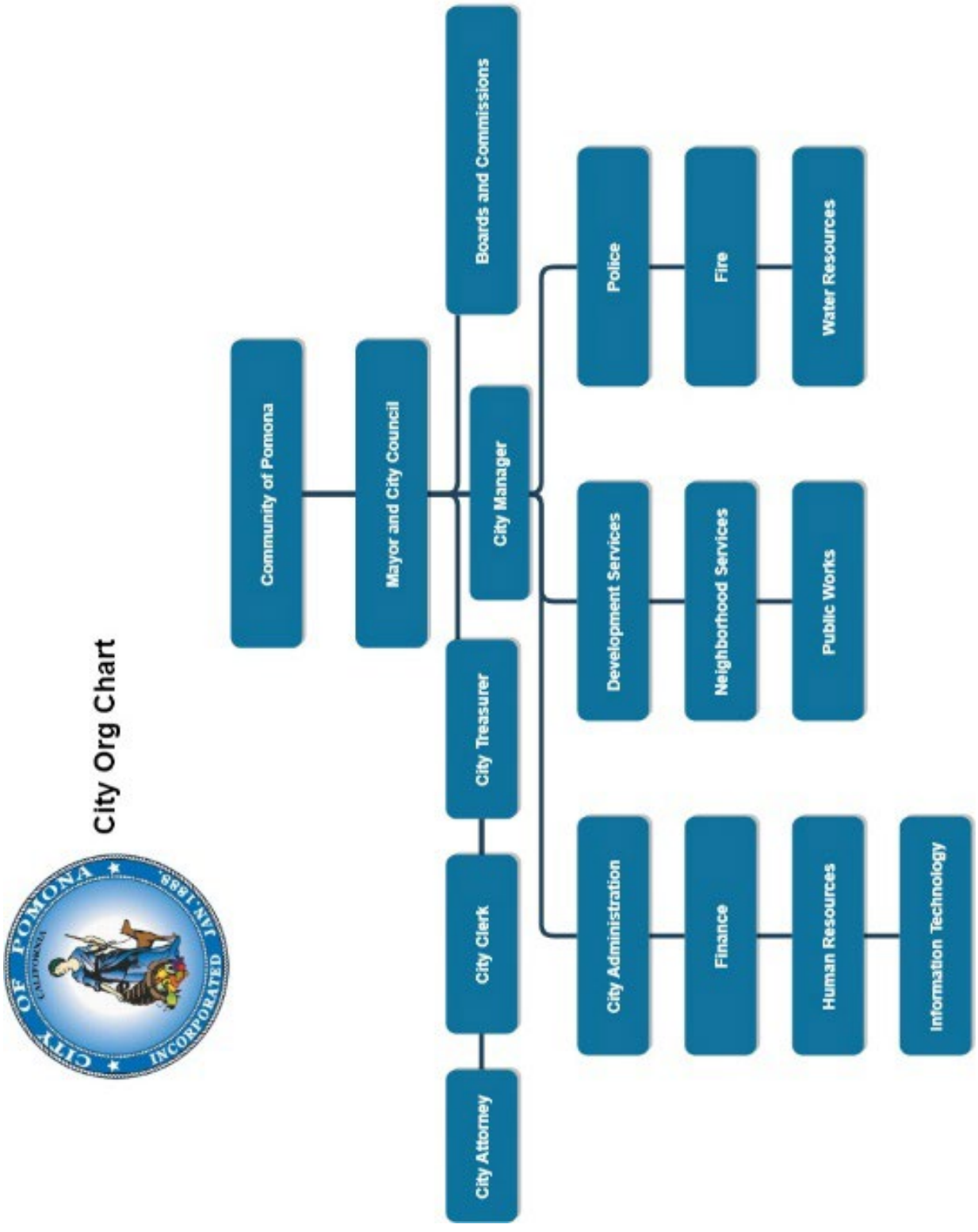
Level: Regional
Hazard: Earthquake
www.wsspc.org/home.html
125 California Avenue, Palo Alto, CA 94306
Ph: 650.330.1101

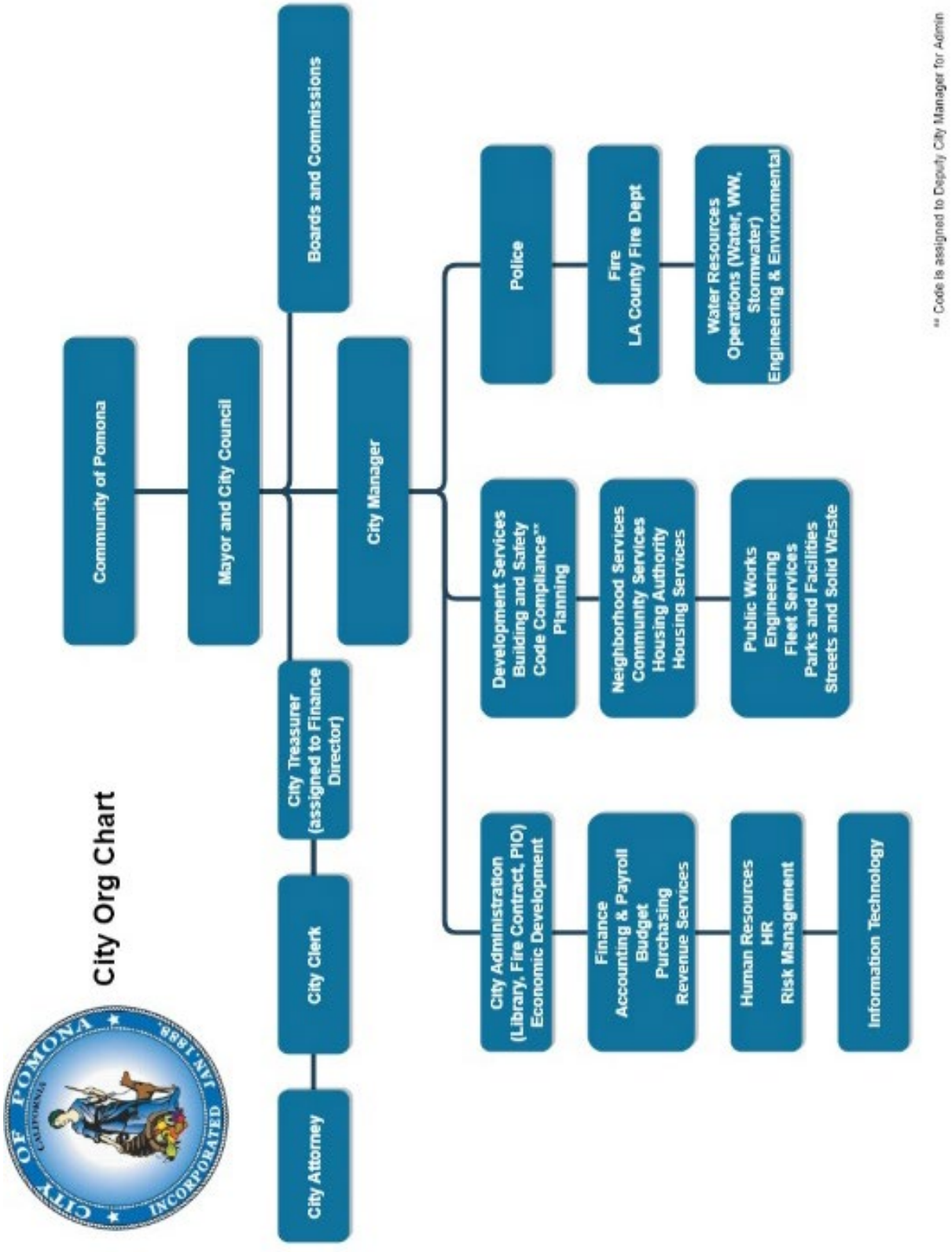
Notes: WSSPC is a regional earthquake consortium funded mainly by FEMA. Its website is a great resource, with information clearly categorized - from policy to engineering to education.

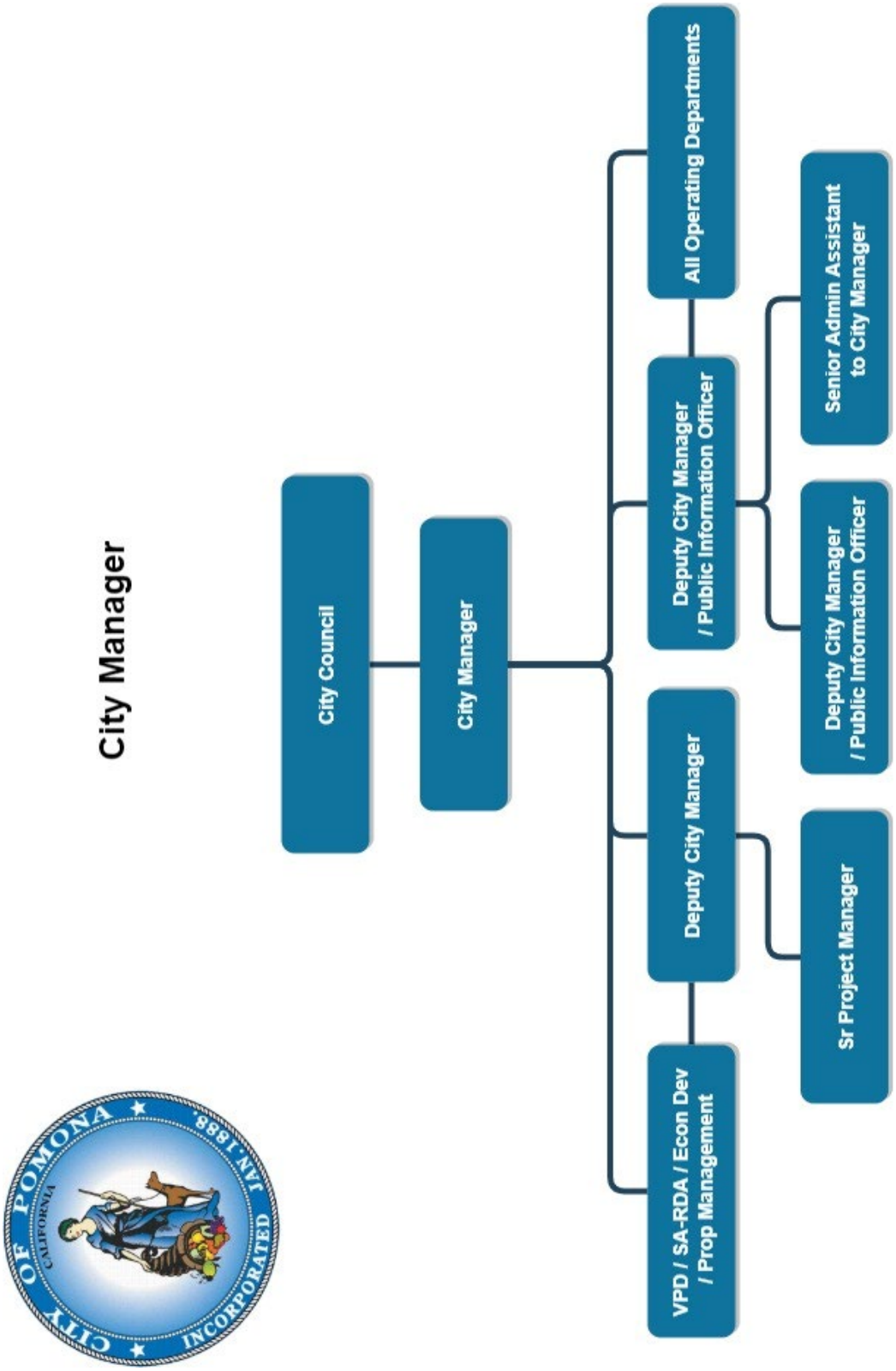
Westside Economic Collaborative C/O Pacific Western Bank

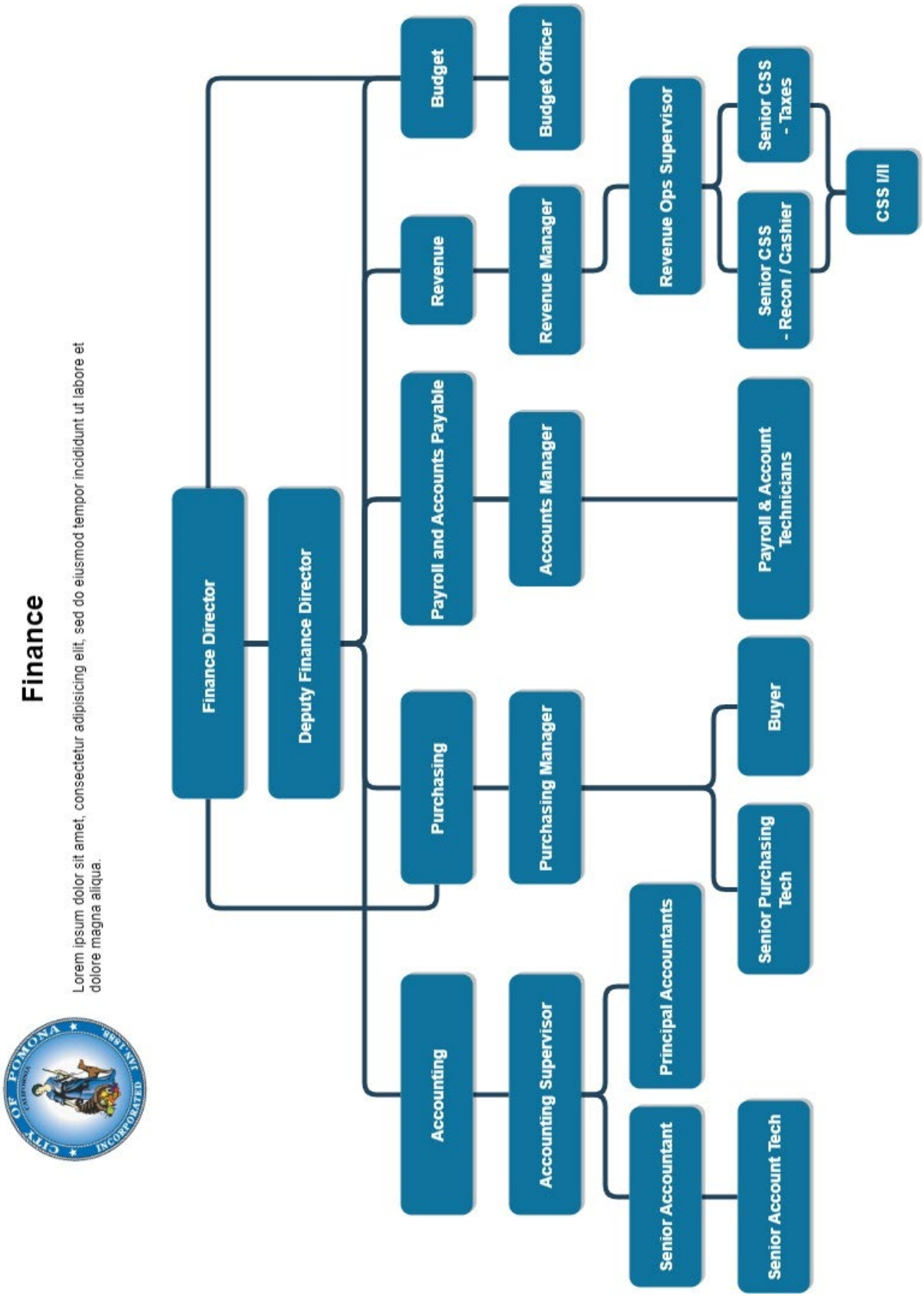
Level: Regional
Hazard: Multi
http://www.westside-la.or
120 Wilshire Boulevard, Santa Monica, CA 90401
Ph: 310.458.1521

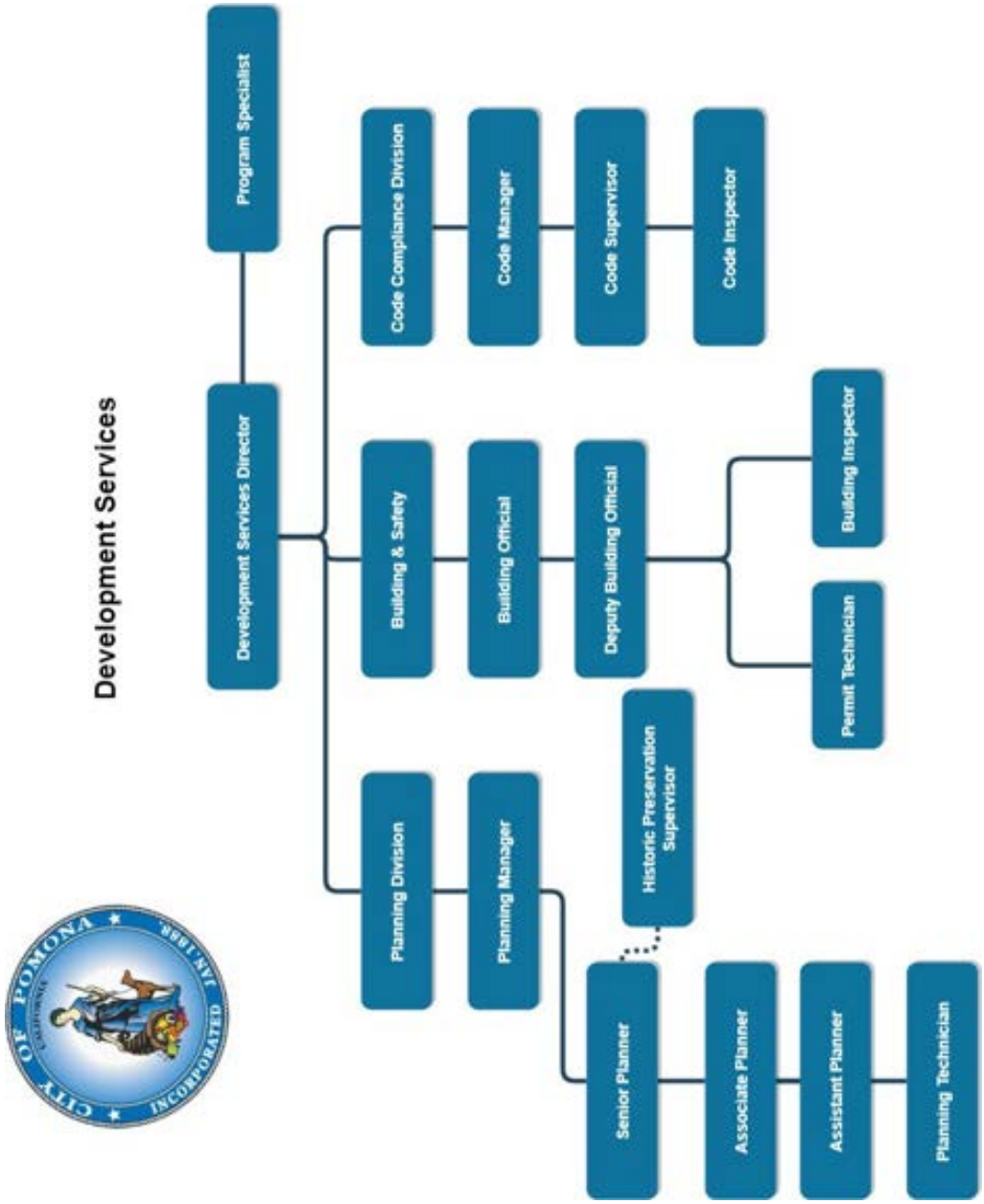
Notes: The Westside Economic Development Collaborative is the first Westside regional economic development corporation. The Westside EDC functions as an information gatherer and resource center, as well as a forum, through bringing business, government, and residents together to address issues affecting the region: Economic Diversity, Transportation, Housing, Workforce Training and Retraining, Lifelong Learning, Tourism, and Embracing Diversity.

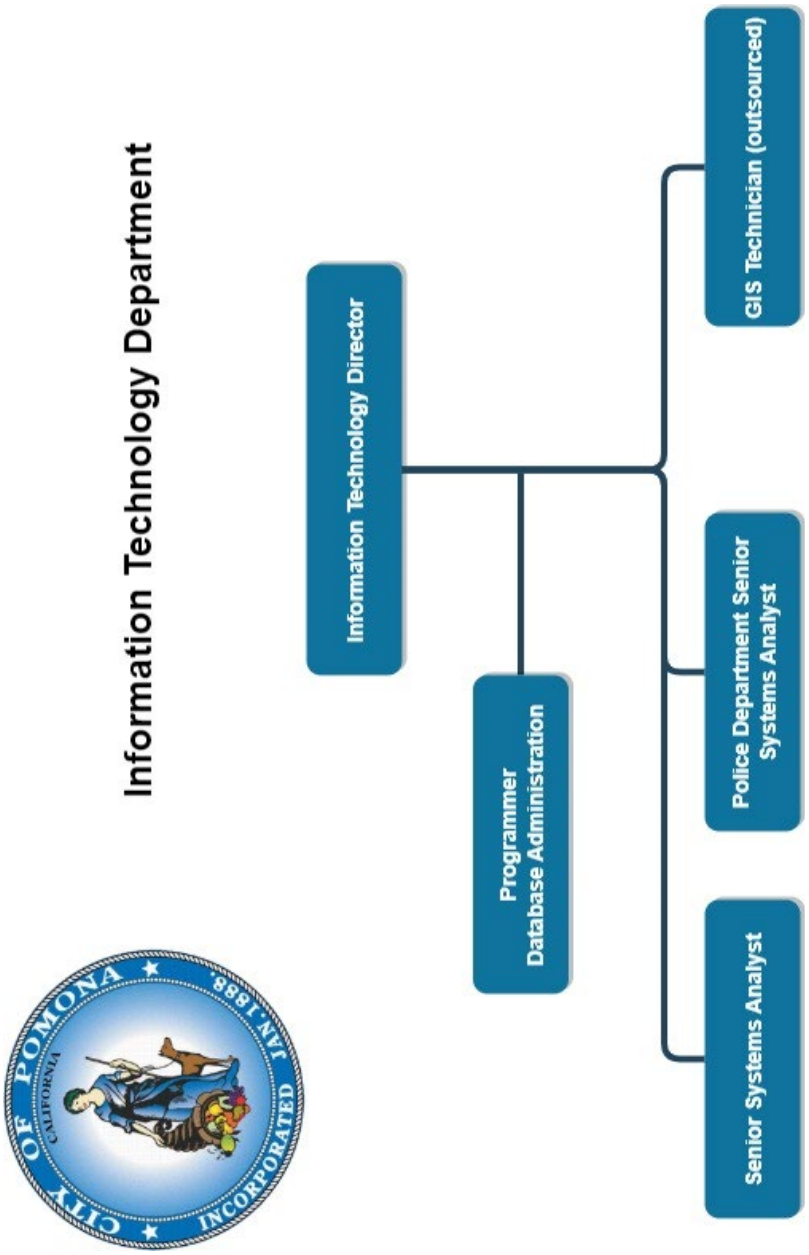

City Org Chart
Community of Pomona
Mayor and City Council
Boards and Commissions
City Manager
City Treasurer
City Clerk
City Attorney
Police
Fire
Water Resources
Development Services
Neighborhood Services
Public Works
City Administration
Finance
Human Resources
Information Technology

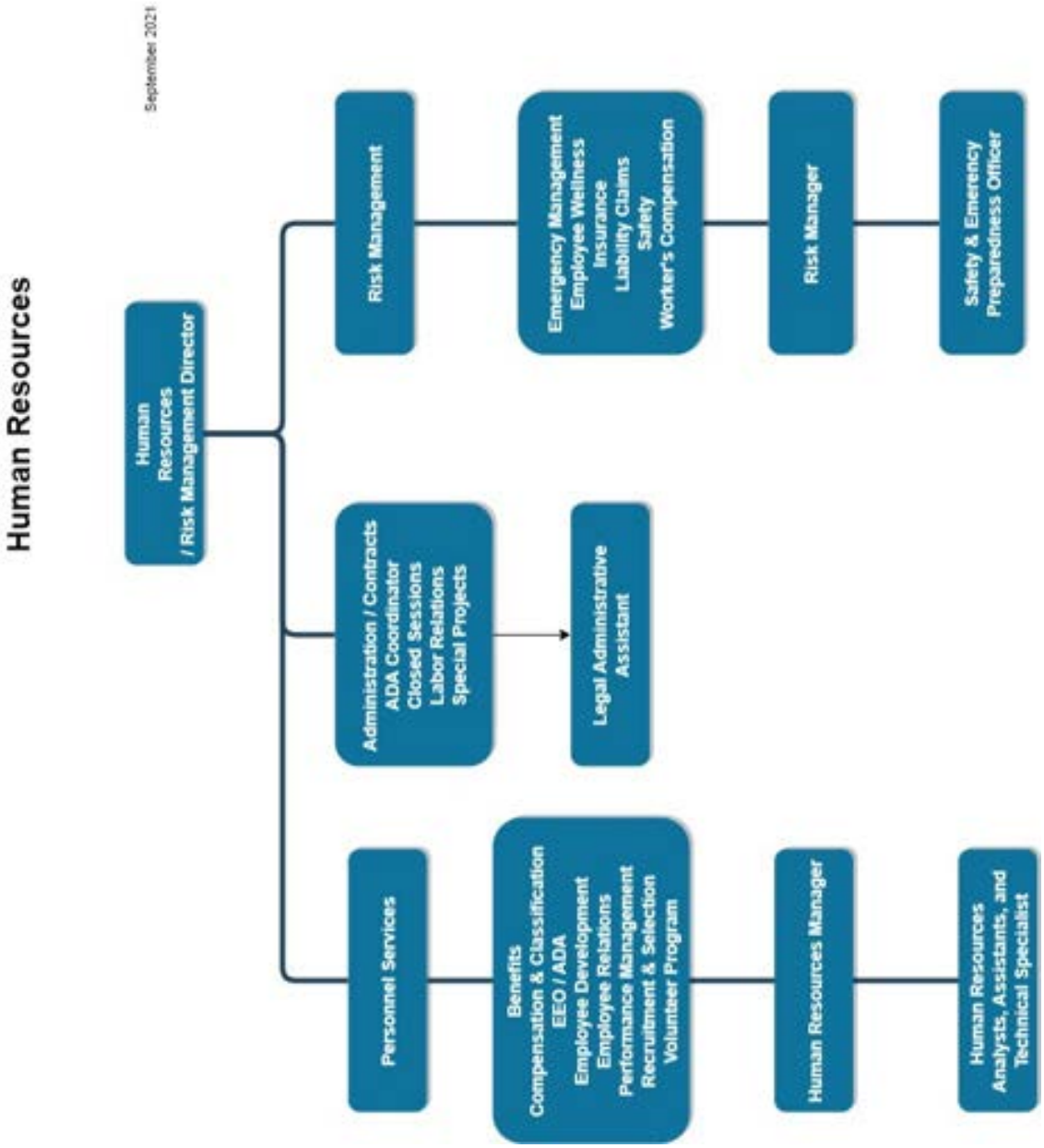

City Org Chart
Community of Pomona
Mayor and City Council
Boards and Commissions
City Manager
City Treasurer (assigned to Finance Director)
City Clerk
City Attorney
City Administration (Library, Fire Contract, PIO) Economic Development
Finance Accounting & Payroll Budget Purchasing Revenue Services
Human Resources HR Risk Management
Information Technology
Development Services Building and Safety Code Compliance** Planning
Neighborhood Services Community Services Housing Authority Housing Services
Public Works Engineering Fleet Services Parks and Facilities Streets and Solid Waste
Police
Fire LA County Fire Dept
Water Resources Operations (Water, WW, Stormwater) Engineering & Environmental
** Code is assigned to Deputy City Manager for Admin

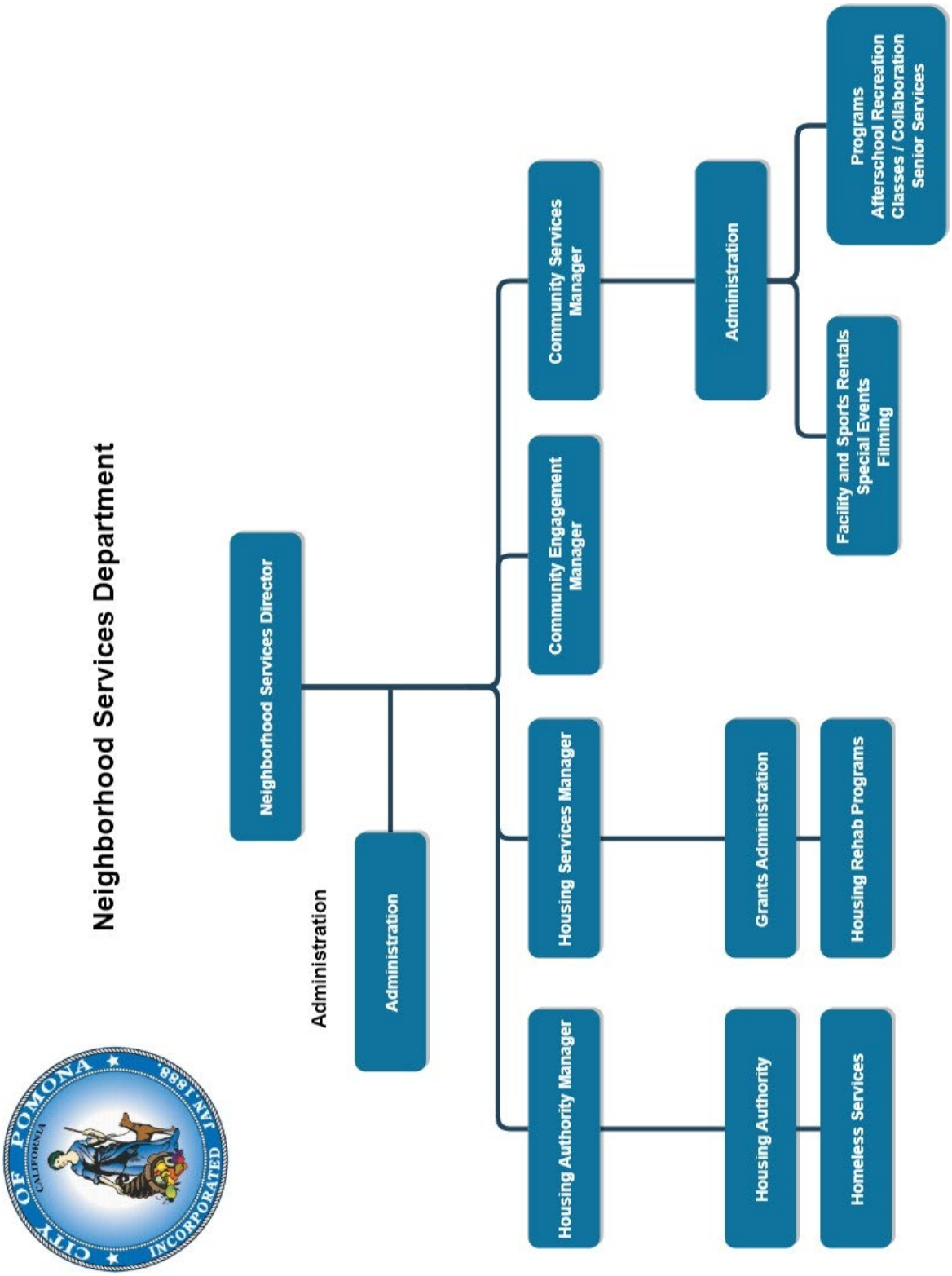

City Manager
City Council
City Manager
Deputy City Manager / Public Information Officer
All Operating Departments
Senior Admin Assistant to City Manager
Deputy City Manager / Public Information Officer
Deputy City Manager
Sr Project Manager
VPD / SA-RDA / Econ Dev / Prop Management

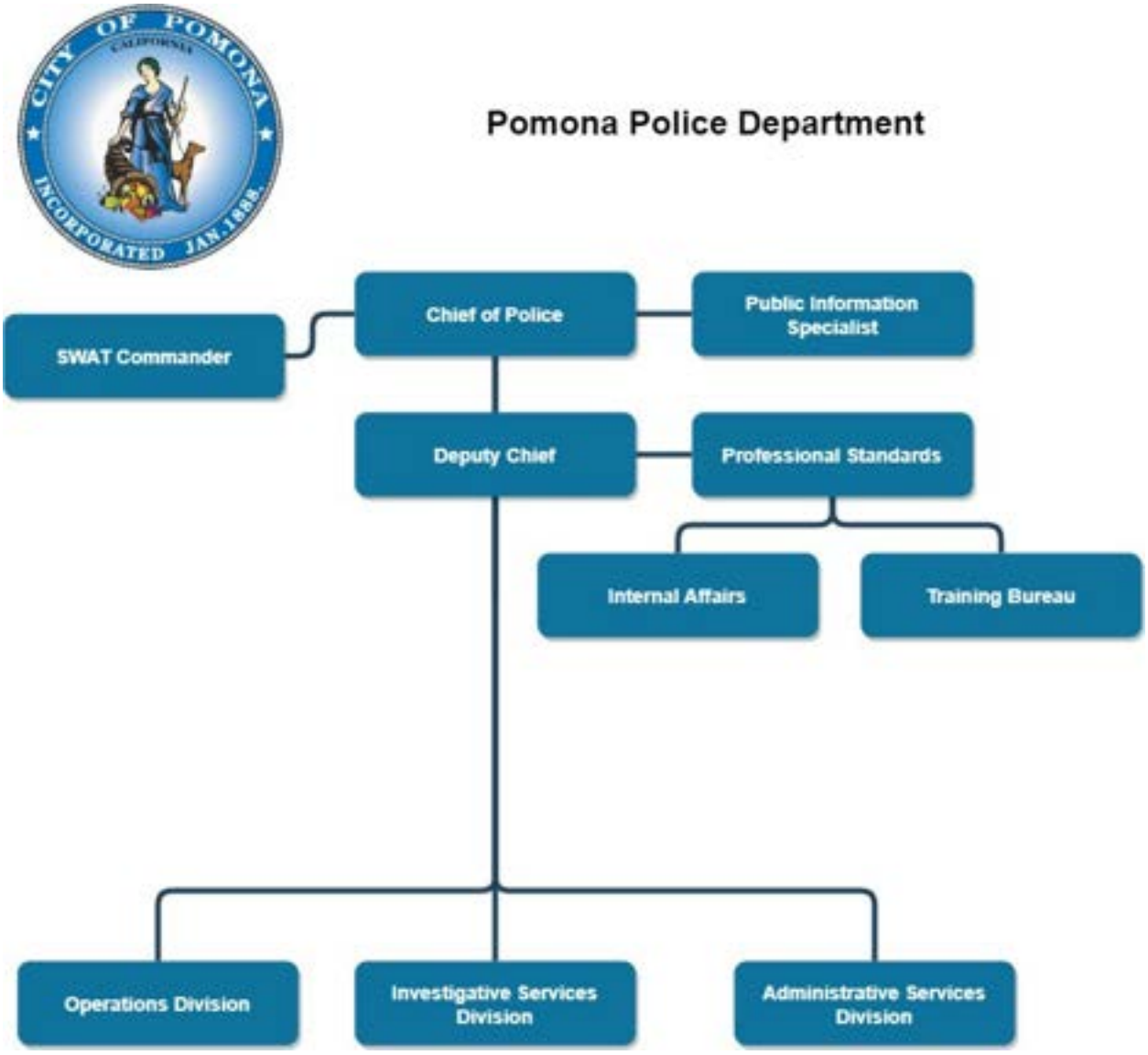

Finance
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Finance Director
Deputy Finance Director
Budget
Budget Officer
Revenue
Revenue Manager
Revenue Ops Supervisor
Senior CSS - Taxes
Senior CSS - Recon / Cashier
CSS I/II
Payroll and Accounts Payable
Accounts Manager
Payroll & Account Technicians
Purchasing
Purchasing Manager
Buyer
Senior Purchasing Tech
Accounting
Accounting Supervisor
Principal Accountants
Senior Accountant
Senior Account Tech

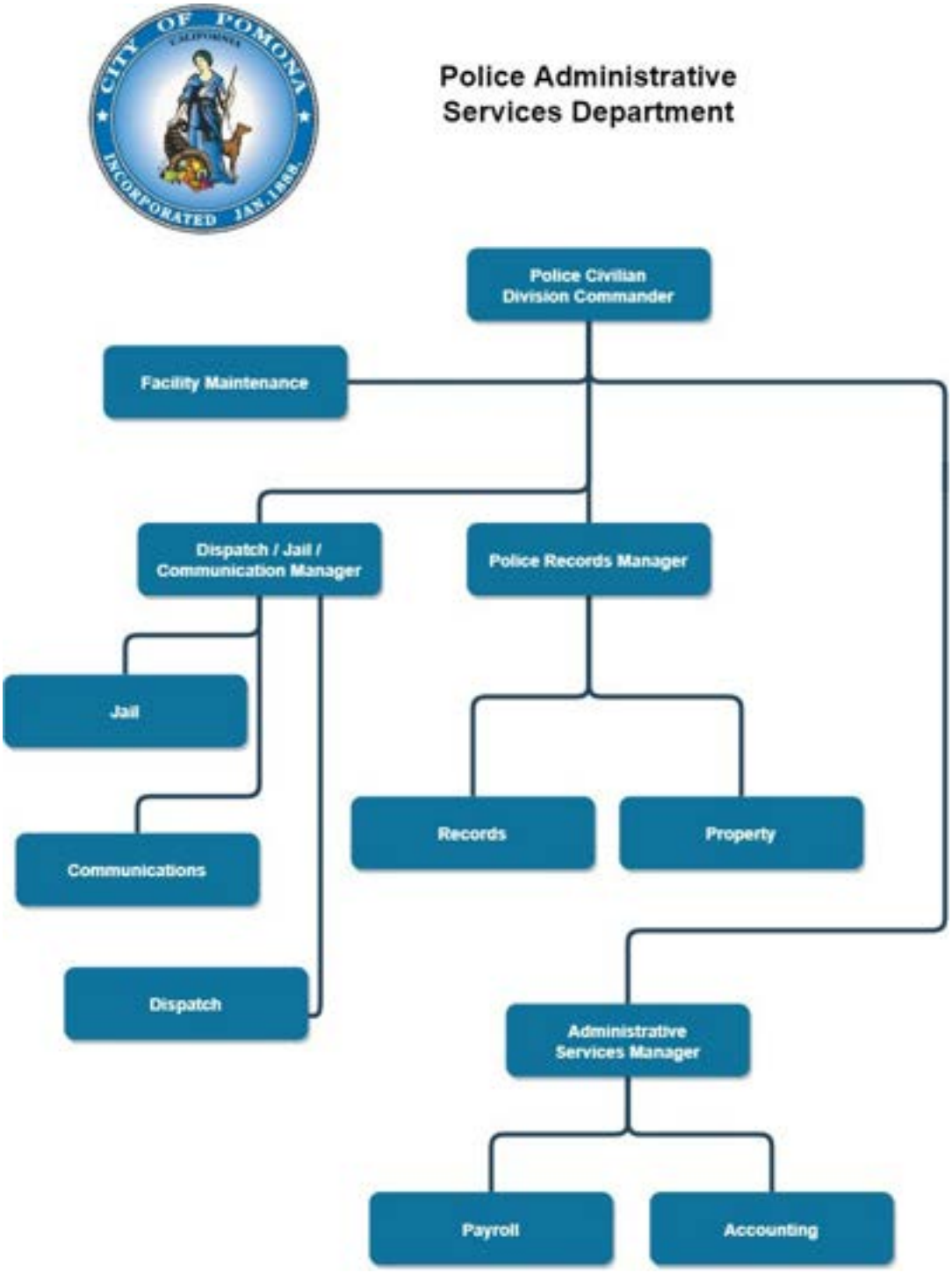

Development Services
Program Specialist
Development Services Director
Code Compliance Division
Code Manager
Code Supervisor
Code Inspector
Building & Safety
Building Official
Deputy Building Official
Building Inspector
Permit Technician
Planning Division
Planning Manager
Historic Preservation Supervisor
Senior Planner
Associate Planner
Assistant Planner
Planning Technician

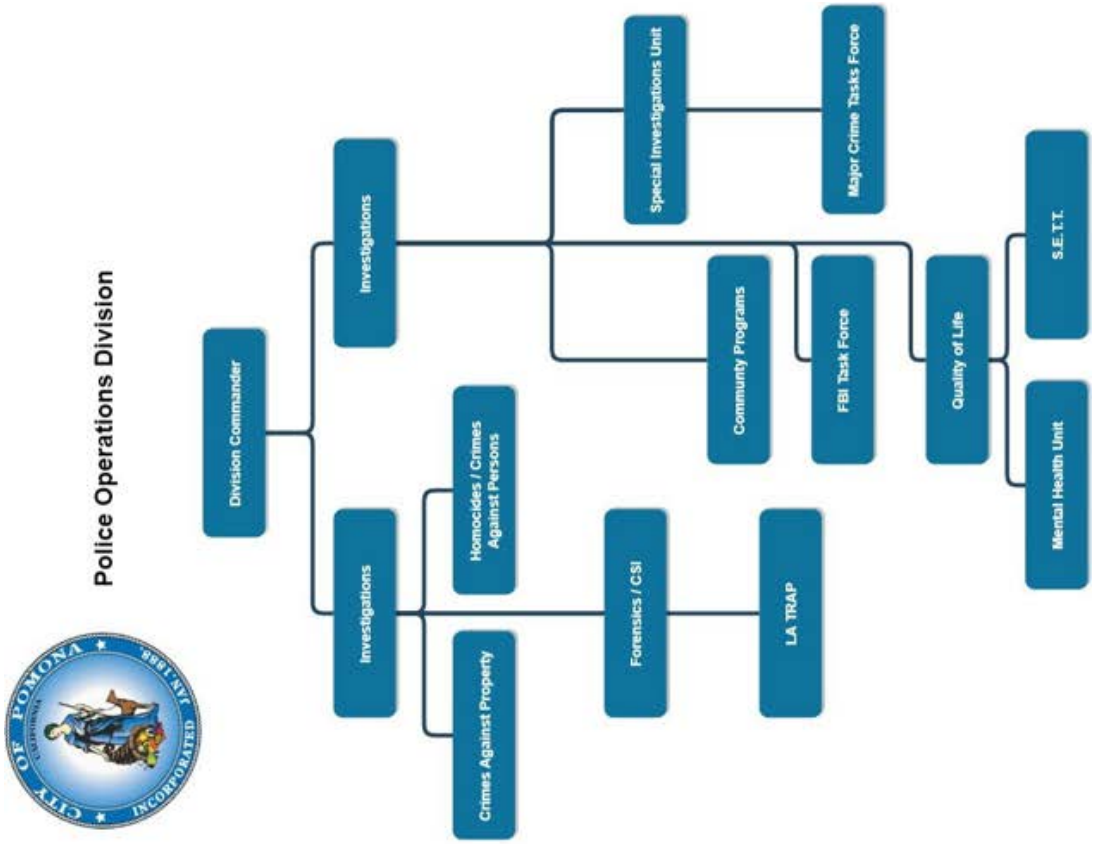

Information Technology Department
Information Technology Director
Programmer
Database Administration
GIS Technician (outsourced)
Police Department Senior
Systems Analyst
Senior Systems Analyst

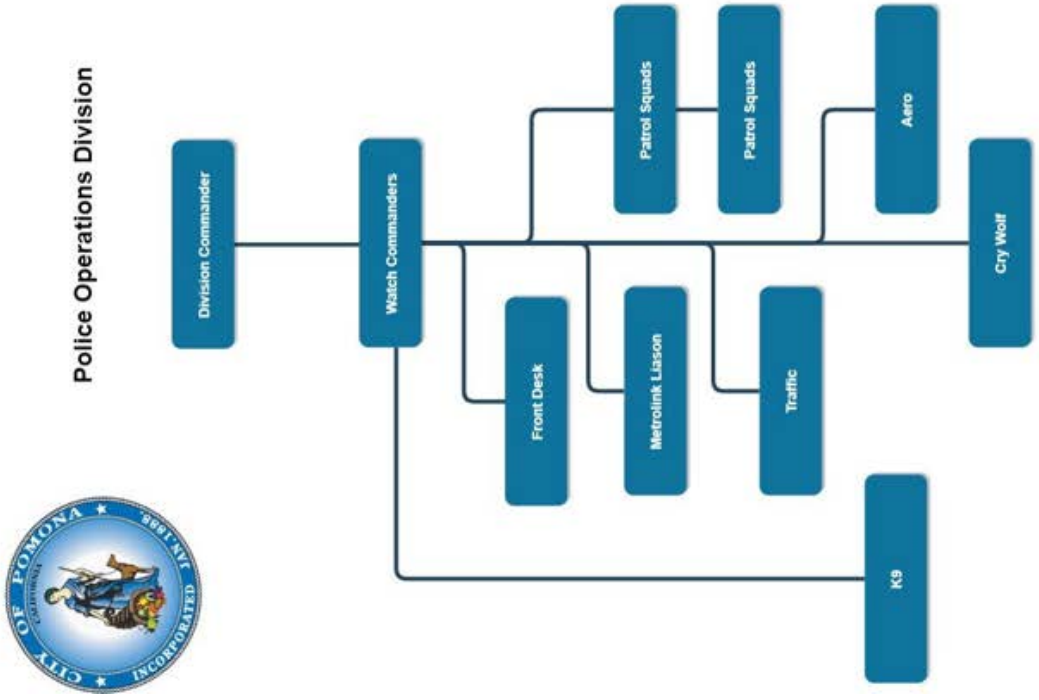

Human Resources
September 2021
Human Resources / Risk Management Director
Risk Management
Emergency Management
Employee Wellness
Insurance
Liability Claims
Safety
Worker's Compensation
Risk Manager
Safety & Emergency Preparedness Officer
Administration / Contracts
ADA Coordinator
Closed Sessions
Labor Relations
Special Projects
Legal Administrative Assistant
Personnel Services
Benefits
Compensation & Classification
EEO / ADA
Employee Development
Employee Relations
Performance Management
Recruitment & Selection
Volunteer Program
Human Resources Manager
Human Resources Analysts, Assistants, and Technical Specialist

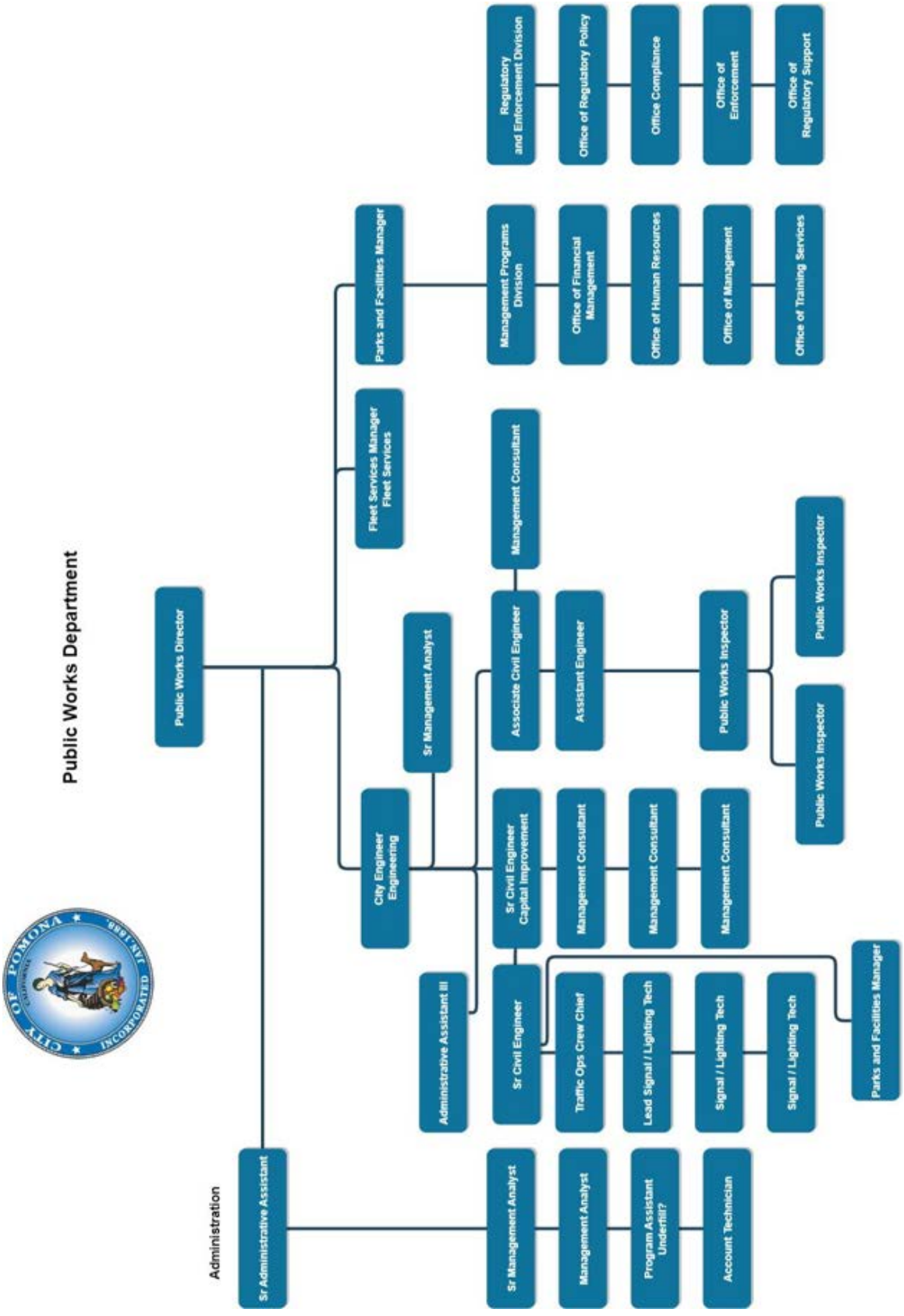

Neighborhood Services Department
Neighborhood Services Director
Administration
Administration
Community Engagement Manager
Housing Services Manager
Grants Administration
Housing Rehab Programs
Housing Authority Manager
Housing Authority
Homeless Services
Community Services Manager
Administration
Programs
Afterschool Recreation
Classes / Collaboration
Senior Services
Facility and Sports Rentals
Special Events
Filming

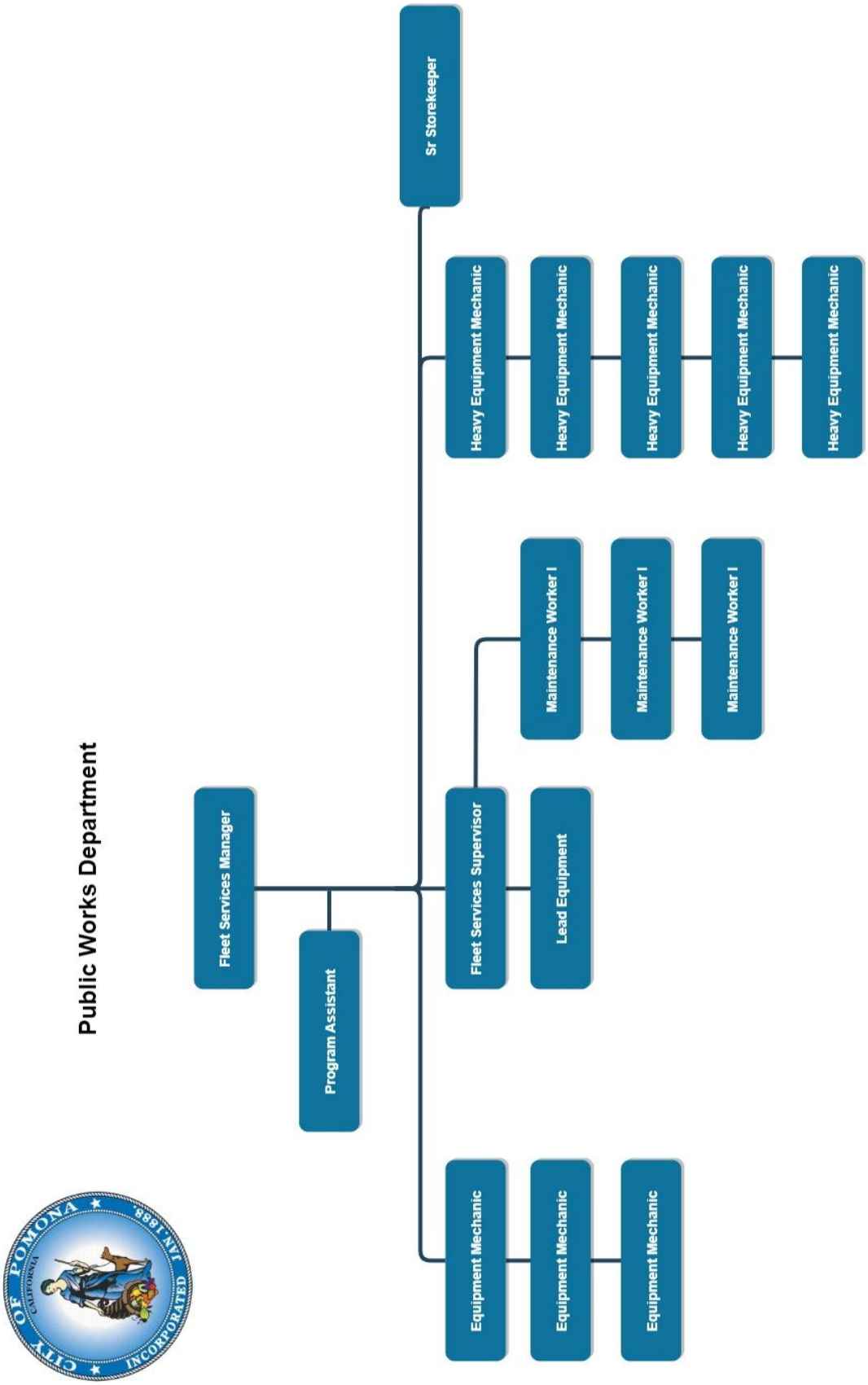

Pomona Police Department
Chief of Police
Public Information Specialist
SWAT Commander
Deputy Chief
Professional Standards
Internal Affairs
Training Bureau
Operations Division
Investigative Services Division
Administrative Services Division

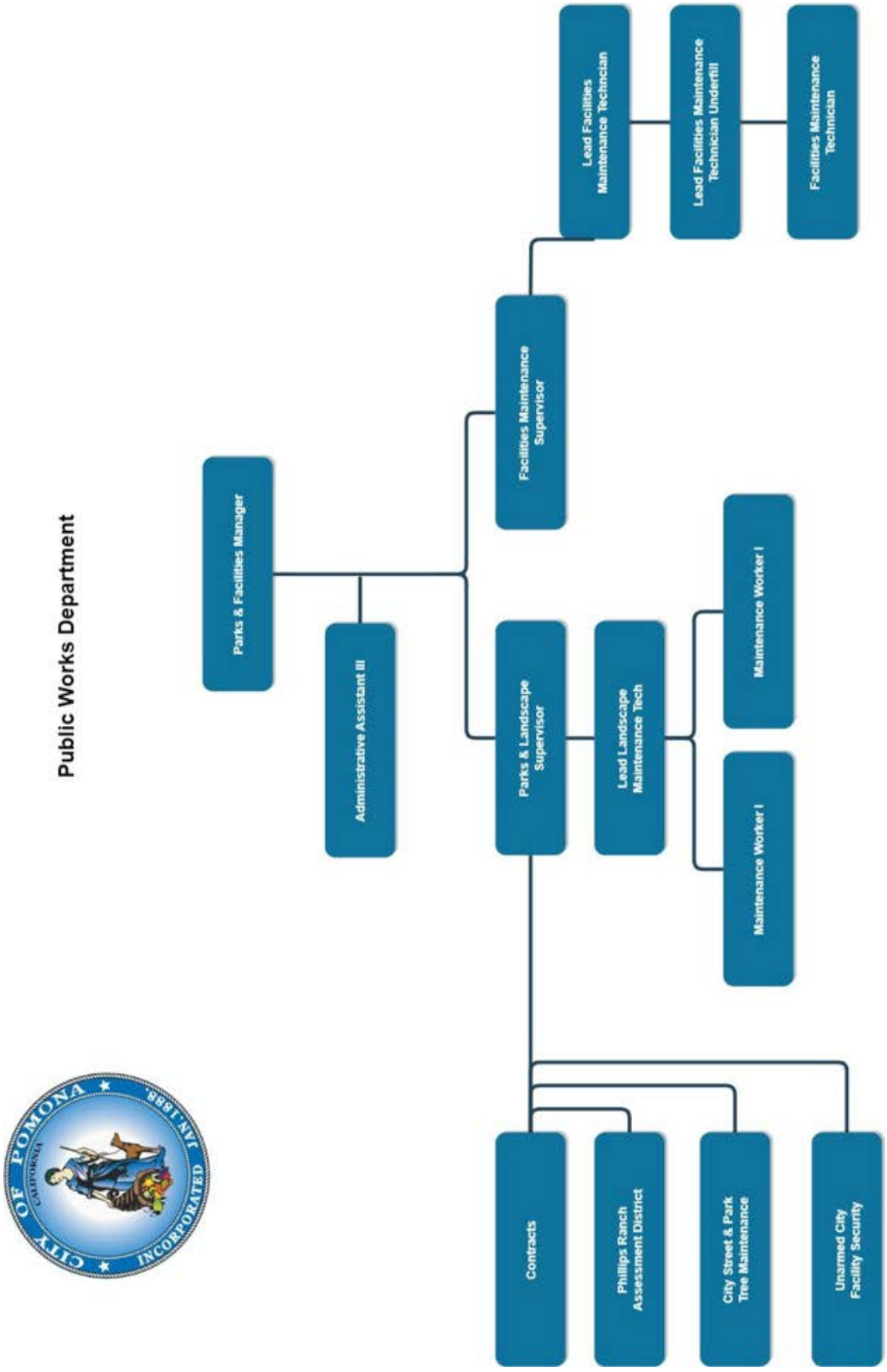

Police Administrative Services Department
Police Civilian Division Commander
Facility Maintenance
Dispatch / Jail / Communication Manager
Police Records Manager
Jail
Communications
Dispatch
Records
Property
Administrative Services Manager
Payroll
Accounting

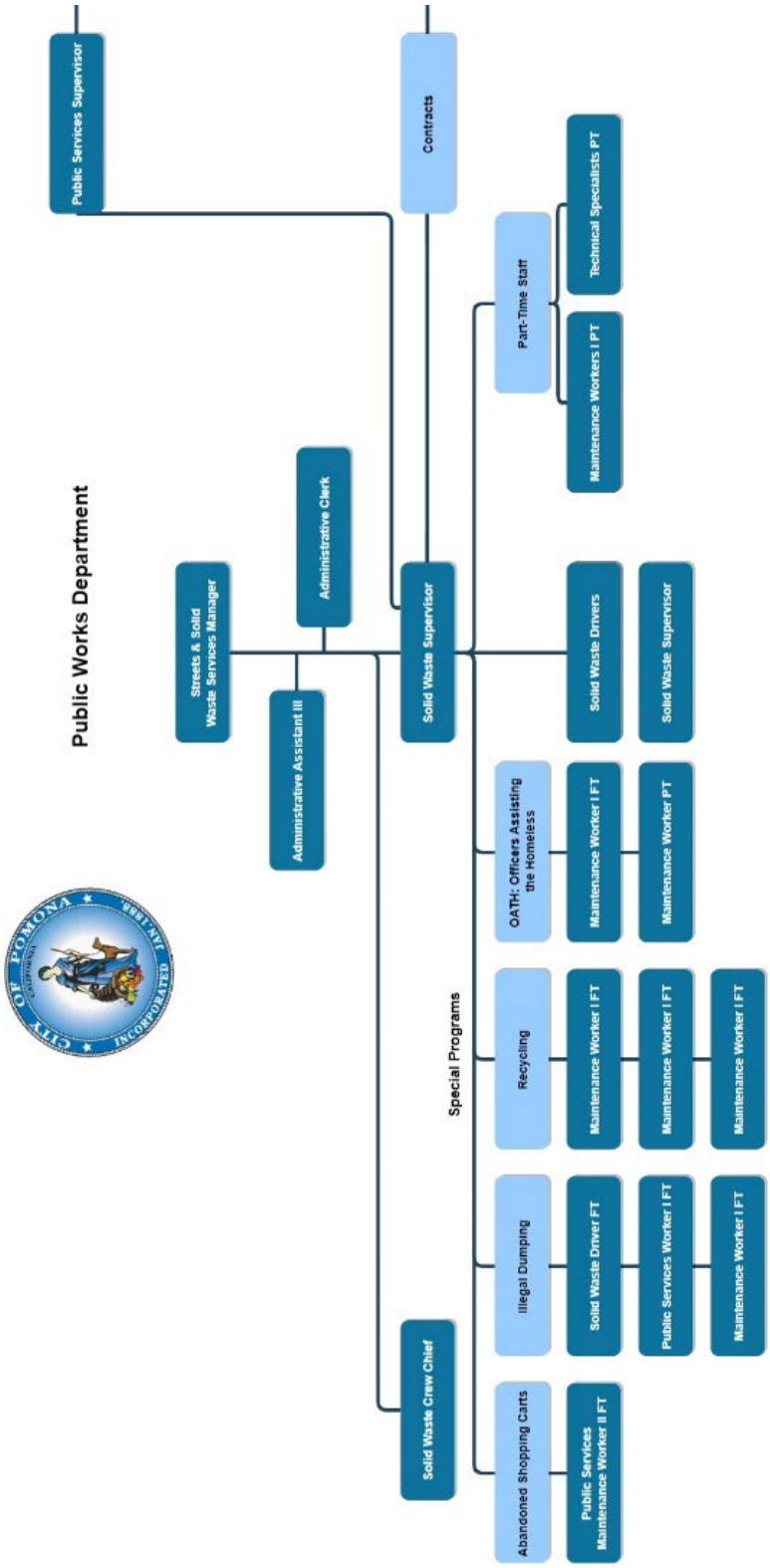

Police Operations Division
Division Commander
Investigations
Special Investigations Unit
Major Crime Tasks Force
Community Programs
FBI Task Force
Quality of Life
S.E.T.T.
Mental Health Unit
Investigations
Homocides / Crimes Against Persons
Crimes Against Property
Forensics / CSI
LA TRAP

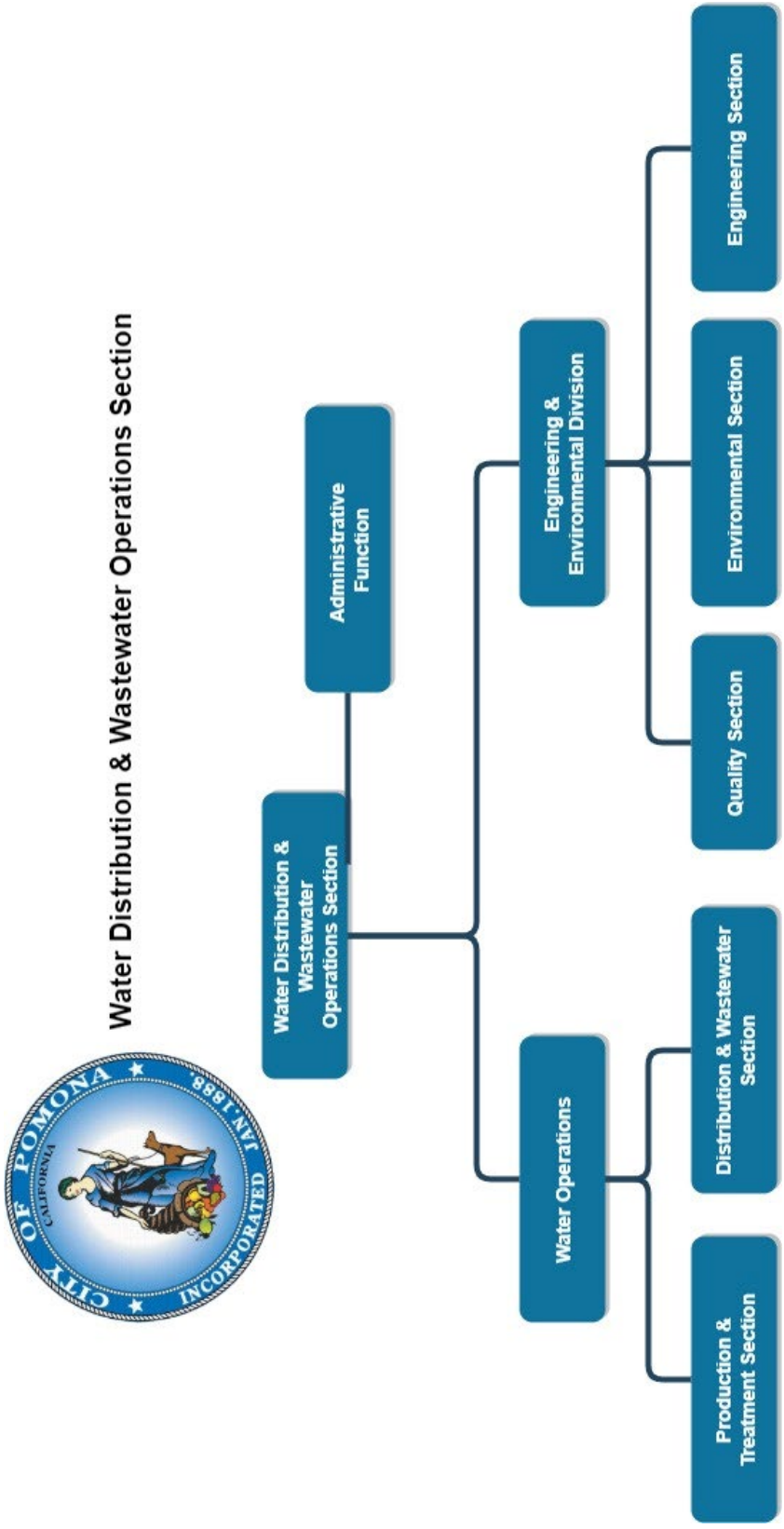

Police Operations Division
Division Commander
Watch Commanders
Patrol Squads
Patrol Squads
Aero
Cry Wolf
Front Desk
Metrolink Liason
Traffic
K9


Public Works Department
Public Works Director
Administration
Sr Administrative Assistant
Sr Management Analyst
Management Analyst
Program Assistant Undermil?
Account Technician
City Engineer Engineering
Sr Management Analyst
Administrative Assistant III
Fleet Services Manager Fleet Services
Parks and Facilities Manager
Sr Civil Engineer Capital Improvement
Sr Civil Engineer
Traffic Ops Crew Chief
Lead Signal / Lighting Tech
Signal / Lighting Tech
Signal / Lighting Tech
Parks and Facilities Manager
Management Consultant
Associate Civil Engineer
Assistant Engineer
Management Consultant
Management Consultant
Management Consultant
Public Works Inspector
Public Works Inspector
Public Works Inspector
Management Programs Division
Office of Financial Management
Office of Human Resources
Office of Management
Office of Training Services
Regulatory and Enforcement Division
Office of Regulatory Policy
Office Compliance
Office of Enforcement
Office of Regulatory Support


Public Works Department
Fleet Services Manager
Program Assistant
Fleet Services Supervisor
Lead Equipment
Maintenance Worker I
Maintenance Worker I
Maintenance Worker I
Sr Storekeeper
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Equipment Mechanic
Equipment Mechanic
Equipment Mechanic


Public Works Department
Parks & Facilities Manager
Administrative Assistant III
Facilities Maintenance Supervisor
Lead Facilities Maintenance Technician
Lead Facilities Maintenance Technician Underfill
Facilities Maintenance Technician
Parks & Landscape Supervisor
Lead Landscape Maintenance Tech
Maintenance Worker I
Maintenance Worker I
Contracts
Phillips Ranch Assessment District
City Street & Park Tree Maintenance
Unarmed City Facility Security


Public Works Department
Public Services Supervisor
Contracts
Streets & Solid Waste Services Manager
Administrative Clerk
Administrative Assistant III
Solid Waste Supervisor
Part-Time Staff
Technical Specialists PT
Maintenance Workers I PT
Solid Waste Drivers
Solid Waste Supervisor
Special Programs
OATH: Officers Assisting the Homeless
Maintenance Worker I FT
Maintenance Worker PT
Recycling
Maintenance Worker I FT
Maintenance Worker I FT
Maintenance Worker I FT
Illegal Dumping
Solid Waste Driver FT
Public Services Worker I FT
Maintenance Worker I FT
Solid Waste Crew Chief
Abandoned Shopping Carts
Public Services Maintenance Worker II FT


Water Distribution & Wastewater Operations Section
Water Distribution & Wastewater Operations Section
Administrative Function
Water Operations
Production & Treatment Section
Distribution & Wastewater Section
Engineering & Environmental Division
Quality Section
Environmental Section
Engineering Section

Appendix D:

Economic Analysis Guidelines for Natural Hazard Mitigation Projects

APPENDIX D: ECONOMIC ANALYSIS GUIDELINES FOR NATURAL HAZARD MITIGATION PROJECTS

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

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

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

PURPOSE

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

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

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

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

ECONOMIC ANALYSIS APPROACHES FOR MITIGATION STRATEGIES

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

Benefit/Cost Analysis

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

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

Cost-Effectiveness Analysis

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

Investing in public sector mitigation activities

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

Investing in private sector mitigation activities

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

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

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

CONDUCTING AN ECONOMIC ANALYSIS

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

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

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

    - *Determine the project cost*. This may include initial project development costs, and repair and operating costs of maintaining projects over time.
    - *Estimate the benefits*. Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.
    - *Consider costs and benefits to society and the environment.* These are not easily measured but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
    - *Determine the correct discount rate*. Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

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

    - *Net present value*. Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate and identifying the present and future costs and benefits of the project calculates the net present value of projects.
    - *Internal Rate of Return*. Using the internal rate of return method to evaluate mitigation

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

Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can

consider other factors, such as risk; project effectiveness; and economic, environmental, and social returns in choosing the appropriate project for implementation.

ECONOMIC RETURNS OF NATURAL HAZARD MITIGATION

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

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

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

ADDITIONAL COSTS FROM NATURAL HAZARDS

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

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

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

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

ADDITIONAL CONSIDERATIONS

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

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

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Appendix E:

List of Acronyms

APPENDIX E: LIST OF ACRONYMS

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

TOR	Transfer of Development Rights
UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
USGS	United States Geological Survey
WSSPC	Western States Seismic Policy

CALIFORNIA ACRONYMS

A&W	Alert and Warning
AA	Administering Areas
AAR	After Action Report
ARC	American Red Cross
ARP	Accidental Risk Prevention
ATC20	Applied Technology Council 20
ATC21	Applied Technology Council 21
BCP	Budget Change Proposal
BSA	California Bureau of State Audits
CAER	Community Awareness & Emergency Response
CalARP	California Accidental Release Prevention
CalBO	California Building Officials
CalEPA	California Environmental Protection Agency
CalREP	California Radiological Emergency Plan
CALSTARS	California State Accounting Reporting System
CalTrans	California Department of Transportation
CBO	Community Based Organization
CD	Civil Defense
CDF	California Department of Forestry and Fire Protection
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEPEC	California Earthquake Prediction Evaluation Council
CESRS	California Emergency Services Radio System
CHIP	California Hazardous Identification Program
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CLETS	California Law Enforcement Telecommunications System
CSTI	California Specialized Training Institute
CUEA	California Utilities Emergency Association
CUPA	Certified Unified Program Agency
DAD	Disaster Assistance Division (of the state Office of Emergency Svcs)
DFO	Disaster Field Office

DGS	California Department of General Services
DHSRHB	California Department of Health Services, Radiological Health Branch
DO	Duty Officer
DOC	Department Operations Center
DOE	Department of Energy (U.S.)
DOF	California Department of Finance
DOJ	California Department of Justice
DPA	California Department of Personnel Administration
DPIG	Disaster Preparedness Improvement Grant
DR	Disaster Response
DSA	Division of the State Architect
DSR	Damage Survey Report
DSW	Disaster Service Worker
DWR	California Department of Water Resources
EAS	Emergency Alerting System
EDIS	Emergency Digital Information System
EERI	Earthquake Engineering Research Institute
EMA	Emergency Management Assistance
EMI	Emergency Management Institute
EMMA	Emergency Managers Mutual Aid
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency (U.S.)
EPEDAT	Early Post Earthquake Damage Assessment Tool
EPI	Emergency Public Information
EPIC	Emergency Public Information Council
ESC	Emergency Services Coordinator
FAY	Federal Award Year
FDAA	Federal Disaster Assistance Administration
FEAT	Governor's Flood Emergency Action Team
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FIR	Final Inspection Reports
FIRESCOPE	Firefighting Resources of So. Calif Organized for Potential Emergencies
FMA	Flood Management Assistance
FSR	Feasibility Study Report
FY	Fiscal Year
GIS	Geographical Information System
HAZMAT	Hazardous Materials
HAZMIT	Hazardous Mitigation
HAZUS	Hazards United States (an earthquake damage assessment prediction tool)
HAD	Housing and Community Development
HEICS	Hospital Emergency Incident Command System
HEPG	Hospital Emergency Planning Guidance

HIA	Hazard Identification and Analysis Unit
HMEP	Hazardous Materials Emergency Preparedness
HMGP	Hazard Mitigation Grant Program
IDE	Initial Damage Estimate
IA	Individual Assistance
IFG	Individual & Family Grant (program)
IRG	Incident Response Geographic Information System
IPA	Information and Public Affairs (of state Office of Emergency Services)
LAN	Local Area Network
LEMMA	Law Enforcement Master Mutual Aid
LEPC	Local Emergency Planning Committee
MARAC	Mutual Aid Regional Advisory Council
MHID	Multi-hazard Identification
MOU	Memorandum of Understanding
NBC	Nuclear, Biological, Chemical
NEMA	National Emergency Management Agency
NEMIS	National Emergency Management Information System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Association
NPP	Nuclear Power Plant
NSF	National Science Foundation
NWS	National Weather Service
OA	Operational Area
OASIS	Operational Area Satellite Information System
OCC	Operations Coordination Center
OCD	Office of Civil Defense
OEP	Office of Emergency Planning
OES	California Governor's Office of Emergency Services
OSHPD	Office of Statewide Health Planning and Development
OSPR	Oil Spill Prevention and Response
PA	Public Assistance
PC	Personal Computer
PDA	Preliminary Damage Assessment
PIO	Public Information Office
POST	Police Officer Standards and Training
PPA/CA	Performance Partnership Agreement/Cooperative Agreement/Cooperative Agreement (FEMA)
PSA	Public Service Announcement
PTAB	Planning and Technological Assistance Branch
PTR	Project Time Report
RA	Regional Administrator (OES)
RADEF	Radiological Defense (program)
RAMP	Regional Assessment of Mitigation Priorities
RAPID	Railroad Accident Prevention & Immediate Deployment
RDO	Radiological Defense Officer

RDMHC	Regional Disaster Medical Health Coordinator
REOC	Regional Emergency Operations Center
REPI	Reserve Emergency Public Information
RES	Regional Emergency Staff
RIMS	Response Information Management System
RMP	Risk Management Plan
RPU	Radiological Preparedness Unit (OES)
RRT	Regional Response Team
SAM	State Administrative Manual
SARA	Superfund Amendments & Reauthorization Act
SAVP	Safety Assessment Volunteer Program
SBA	Small Business Administration
SCO	California State Controller's Office
SEMS	Standardized Emergency Management System
SEPIC	State Emergency Public Information Committee
SLA	State and Local Assistance
SONGS	San Onofre Nuclear Generating Station
SOP	Standard Operating Procedure
SWEPC	Statewide Emergency Planning Committee
TEC	Travel Expense Claim
TRU	Transuranic
TTT	Train the Trainer
UPA	Unified Program Account
UPS	Uninterrupted Power Source
USAR	Urban Search and Rescue
USGS	United States Geological Survey California State
WC	Warning Center
WAN	Wide Area Network
WIPP	Waste Isolation Pilot Project

Source: Disaster Management Area D Coordinator, 2004.

Appendix F:

Glossary

APPENDIX F: GLOSSARY

Acceleration	The rate of change of velocity with respect to time. Acceleration due to gravity at the earth's surface is 9.8 meters per second squared. That means that every second that something falls toward the surface of earth its velocity increases by 9.8 meters per second.
Asset	Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wet-lands, or landmarks.
Base Flood	Flood that has a I percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.
Base Flood Elevation (BFE)	Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as the standard for the National Flood In-surance Program.
Bedrock	The solid rock that underlies loose material, such as soil, sand, clay, or gravel.
Building	A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.
Coastal High Hazard Area	Area, usually along an open coast, bay, or inlet, that is subject to inundation by storm surge and, in some instances, wave action caused by storms or seismic sources.
Coastal Zones	The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.
Community Rating System (CRS)	An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of policyholders in these communities are reduced.
Computer-Aided Design and Drafting (CADD)	A computerized system enabling quick and accurate electronic 2-D and 3-D drawings, topographic mapping, site plans, and profile/cross-section drawings.
Contour	A line of equal ground elevation on a topographic (contour) map.
Critical Facility	Facilities that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
Debris	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
Digitalize	To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer

	applications.
Displacement Time	The average time (in days) which the building's occupants typically must operate from a temporary location to while repairs are made to the original building due to damages resulting from a hazard event.
Duration	How long a hazard event lasts.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
Erosion	Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.
Erosion Hazard Area	Area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.
Essential Facility	Elements that are important to ensure a full recovery of a community or state following a hazard event. These would include: government functions, major employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.
Extent	The size of an area affected by a hazard or hazard event.
Extratropical Cyclone	Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. These cyclonic storms, commonly called nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large -1,000-mile wide storms are not uncommon.
Fault	A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the plane of fracture.
Federal Emergency Management Agency (FEMA)	Independent agency created in 1978 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response and recovery.
Fire Potential Index (FPI)	Developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geo-graphic information, national policy makers and on-the-ground fire managers established priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage sup-pression forces to high fire risk areas.
Flash Flood	A flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood	A general and temporary condition of partial or complete inundation of nor-mally dry land areas from (I) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from

	any source, or (3) mudflows or the sudden collapse of shoreline land.
Flood Depth	Height of the floodwater surface above the ground surface.
Flood Elevation	Elevation of the water sur-face above an established datum, e.g. National Geodetic Vertical Datum of 1929, North American Ver-tical Datum of 1988, or Mean Sea Level.
Flood Hazard Area	The area shown to be inundated by a flood of a given magnitude on a map.
Flood Insurance Rate Map (FIRM)	Map of a community, pre-pared by the Federal Emergency Management Agency that shows both the special flood hazard areas and the risk premium zones applicable to the community.
Flood Insurance Study (FIS)	A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.
Floodplain	Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.
Frequency	A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance -its probability-of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.
Fujita Scale of Tornado Intensity	Rates tornadoes with numeric values from F0 to F5 based on tornado wind-speed and damage sustained. An F0 indicates minimal damage such as broken tree limbs or signs, while and F5 indicated severe damage sustained.
Functional Downtime	The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.
Geographic Area Impacted	The physical area in which the effects of the hazard are experienced.
Geographic Information Systems (GIS)	A computer software application that relates physical features on the earth to a database to be used for mapping and analysis.
Ground Motion	The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions.
Hazard	A source of potential danger or adverse condition. Hazards in this how-to series will include naturally occurring events such as floods, earthquakes, tornadoes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.
Hazard Event	A specific occurrence of a particular type of hazard.
Hazard Identification	The process of identifying hazards that threaten an area.
Hazard Mitigation	Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.

Hazard Profile	A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.
HAZUS (Hazards US)	A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA
Hurricane	An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74- miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the north Atlantic Ocean, northeast Pacific Ocean, or the south Pacific Ocean east of 160°E longitude. Hurricane circulation is counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
Hydrology	The science of dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.
Infrastructure	Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treat-ment facilities, and includes an area's transportation sys-tem such as airports, heliports; highways, bridges, tunnels, roadbeds, over-passes, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, drydocks, piers and regional dams.
Intensity	A measure of the effects of a hazard event at a particular place.
Landslide	Downward movement of a slope and materials under the force of gravity.
Lateral Spreads	Develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies in a seismic event. The phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength.
Liquefaction	Results when the soil supporting structures liquefies. This can cause structures to tip and topple.
Lowest Floor	Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure.
Magnitude	A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.
Mitigation Plan	A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions to minimize future vulnerability to hazards.
National Flood Insurance Program (NFIP)	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 CFR §60.3.
National Geodetic Vertical	Datum established in 1929 and used in the NFIP as a basis for

Datum of 1929 (NGVD)	measuring flood, ground, and structural ele-vations, previously referred to as Sea Level Datum or Mean Sea Level. The Base Flood Elevations shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD.
National Weather Service (NWS)	Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.
Nor'easter	An extra-tropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain.
Outflow	Follows water inundation creating strong currents that rip at structures and pound them with debris and erode beaches and coastal structures.
Planimetric	Describes maps that indicate only man-made features like buildings.
Planning	The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.
Probability	A statistical measure of the likelihood that a hazard event will occur.
Recurrence Interval	The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any given year.
Repetitive Loss Property	A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least $1,000 each have been paid within any 10-year period since 1978.
Replacement Value	The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.
Richter Scale	A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935.
Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.
Riverine	Of or produced by a river.
Scale	A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.
Scarp	A steep slope.
Scour	Removal of soil or fill material by the flow of floodwaters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.
Seismicity	Describes the likelihood of an area being subject to earthquakes.
Special Flood Hazard Area (SFHA)	An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year (100-year floodplain); represented

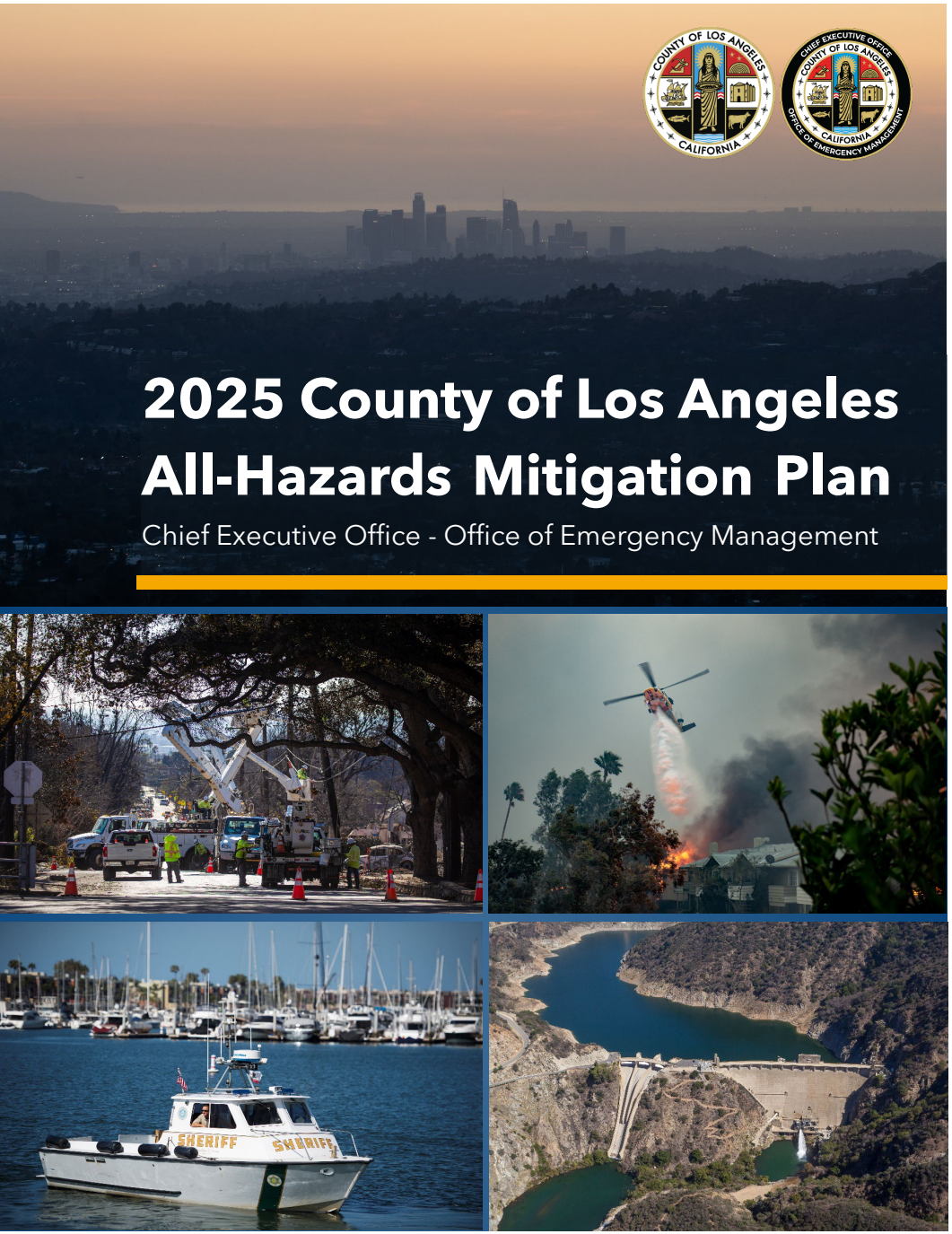
	on Flood Insurance Rate Maps by darkly shaded areas with zone designations that include the letter A or V.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.
State Hazard Mitigation Officer (SHMO)	The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
Storm Surge	Rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface.
Structure	Something constructed. (See also Building)
Substantial Damage	Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage.
Super Typhoon	A typhoon with maximum sustained winds of 150 mph or more.
Surface Faulting	The differential movement of two sides of a fracture - in other words, the location where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults.
Tectonic Plate	Torsionally rigid, thin seg-ments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.
Topographic	Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.
Tornado	A violently rotating column of air extending from a thunderstorm to the ground.
Tropical Cyclone	A generic term for a cyclonic, low-pressure system over tropical or subtropical waters.
Tropical Depression	A tropical cyclone with maximum sustained winds of less than 39 mph.
Tropical Storm	A tropical cyclone with maximum sustained winds greater than 39 mph and less than 74 mph.
Tsunami	Great sea wave produced by submarine earth movement or volcanic eruption.
Typhoon	A special category of tropical cyclone peculiar to the western North Pacific Basin, frequently affecting areas in the vicinity of Guam and the North Mariana Islands. Typhoons whose maximum sustained winds attain or exceed 150 mph are called super typhoons.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of

	another. For example, many businesses depend on uninterrupted electrical power -if an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.
Vulnerability Assessment	The extent of injury and damage that may result from a hazard event of a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.
Water Displacement	When a large mass of earth on the ocean bottom sinks or uplifts, the column of water directly above it is displaced, forming the tsunami wave. The rate of displacement, motion of the ocean floor at the epicenter, the amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.
Wave Runup	The height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).
Wildfire	An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.
Zone	A geographical area shown on a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding in the area

Source: Disaster Management Area D Coordinator, 2004.

APPENDIX C

COUNTY OF LOS ANGELES ALL-HAZARDS MITIGATION PLAN



Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

Table of Contents

Acknowledgement 1
Letter of Promulgation 2
1 Introduction, Purpose, and Scope 6
1.1 Purpose 7
1.2 Scope 7
1.3 Legal Authority and Requirements 7
1.4 Plan Organization 8
2 Planning Process 9
2.1 Overview of the Planning Process 10
2.2 Stakeholder Engagement 13
2.3 Public Involvement and Outreach 18
2.4 Review and Incorporation of Existing Plans and Reports 19
3 Community Profile 22
3.1 Los Angeles County Overview 23
3.2 Geography and Land Use 24
3.3 Social Vulnerability 25
3.4 Economy and Critical Infrastructure 28
3.5 Climate and Environmental Conditions 29
3.6 Regional Collaboration and Planning Efforts 30
3.7 Implications for Hazard Mitigation Planning 31
4 Climate Change 32
4.1 Climate Change Overview 33
4.2 Integrating Climate Change into Hazard Profiles 34
4.3 Climate Mitigation Strategies 36
4.4 Climate Change Conclusion 37

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation 38
5.1 AFN Introduction 39
5.2 Inclusion of AFN and Vulnerable Populations in Planning 39
5.3 Assessment of AFN Needs 40
5.4 Coordination with AFN Support Agencies 42
5.5 AFN Conclusion 42
6 Hazard Identification and Risk Assessment 43
6.1 Hazard Identification Overview 44
6.2 Wildfire 49
6.3 Earthquake 57
6.4 Extreme Heat 67
6.5 Drought 74
6.6 Flooding 82
6.7 Dam Failure 92
6.8 Land Movement 102
6.9 Tsunami 114
6.10 Severe Wind and Tornado 120
6.11 Mass Violence 130
6.12 Cybersecurity Incidents 135
6.13 Transportation Incidents 142
6.14 Public Health Emergencies 147
7 Mitigation Strategy 152
7.1 Mitigation Strategy Overview 153
7.2 Mitigation Goals and Objectives 153
7.3 Existing Mitigation Capabilities 155
7.4 Identification and Analysis of Mitigation Strategies 172

7.5 Status of Previous Mitigation Efforts 184
7.6 Prioritization and Implementation of Mitigation Actions 186
7.7 Integration with Other Plans 189
7.8 Mitigation Action Plan 191
8 Plan Maintenance 196
8.1 Community Participation in Plan Maintenance 197
8.2 Monitoring, Evaluation, and Maintenance 198
8.3 Criteria for Updating the Hazard Mitigation Plan 199
8.4 Plan Update 200
8.5 Integration with Other Plans 201
9 Plan Adoption 202
9.1 Plan Adoption Overview 203
Appendices 204

1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

County of Los Angeles
All-Hazards Mitigation Plan

Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

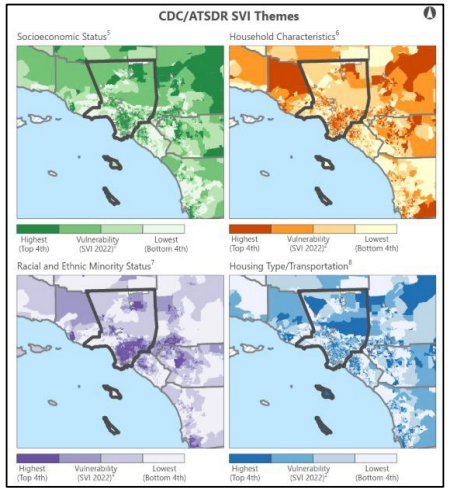


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

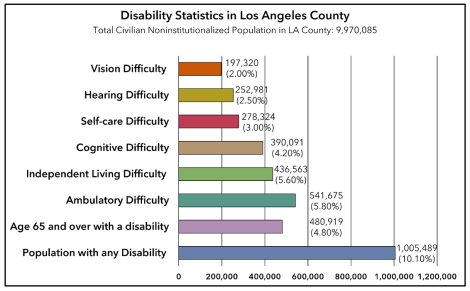


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

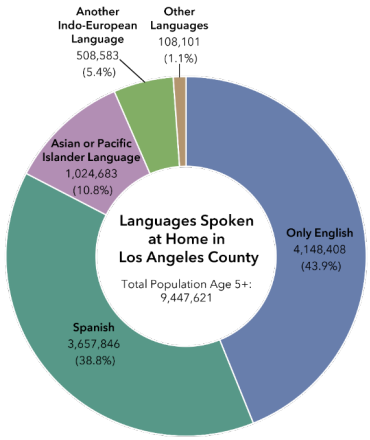


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

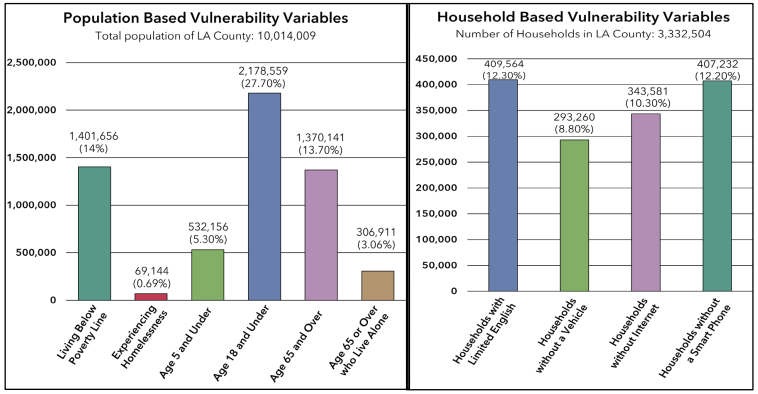


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

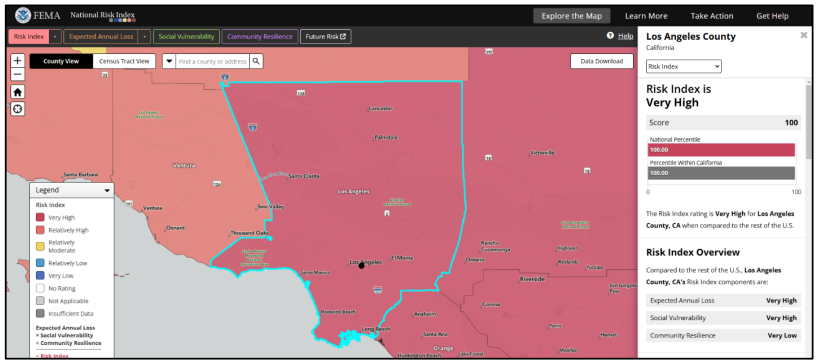


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

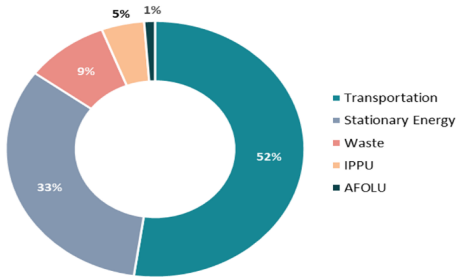
Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.



Abbreviations: AFOLU = agriculture, forestry, and other land use; IPPU = industrial processes and product use

Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature

Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

WILDFIRE
KEY POINTS

1. **Nature**
Wildfires are fast-moving, climate-exacerbated hazards driven by dry vegetation, wind, and terrain, often ignited by lightning or human activity.

2. **Location**
High-risk wildfire areas are concentrated in the foothill areas and along the wildland-urban interface (WUI) in both SRA and LRA zones.

3. **Extent**
Over 1,000 square miles in Los Angeles County are classified as Very High Fire Hazard Severity Zones, with wildfires causing widespread secondary hazards.

4. **Vulnerability**
More than 1.2 million residents—especially in WUI communities with limited evacuation routes—face increased wildfire risk, particularly vulnerable populations.

5. **Mitigation and Preparedness**
Key strategies include defensible space enforcement, fire-resistant construction, CWPPs, vegetation management, and coordinated evacuation planning.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD3**: 117.95 sq mi (27.29%)
  - **SD5**: 95.61 sq mi (3.36%)
  - **SD1**: 16.23 sq mi (4.60%)
  - **SD4**: 9.10 sq mi (4.27%)
  - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature

Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

EARTHQUAKE KEY POINTS

1. **Nature**
   Earthquakes occur when there is a sudden release of energy from the Earth's crust, creating seismic waves.
2. **Location**
   Los Angeles County is in one of the most highly active seismic regions, having multiple active faults.
3. **Extent**
   The San Andreas Fault remains the greatest threat, with a high chance of an M 6.7+ occurring.
4. **Vulnerability**
   Residents in high-risk seismic zones could be extremely impacted, along with people experiencing homelessness, low income, and the access and functional needs community.
5. **Mitigation and Preparedness**
   Efforts include strengthening building codes, upgrading critical infrastructure, expanding public education, and enhancing emergency response planning.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant; buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 1,950.78 sq mi (69.50%)
  - **SD3**: 379.41 sq mi (87.99%)
  - **SD1**: 349.17 sq mi (98.95%)
  - **SD2**: 362.95 sq mi (99.99%)
  - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.

EXTREME HEAT KEY POINTS

1. **Nature**
   Prolonged periods of high temperatures pose significant health risks such as heat exhaustion and heat stroke. Urban heat island (UHI) is rampant in Los Angeles County.
2. **Location**
   Los Angeles County is vulnerable to extreme heat because of its diverse landscape and urban density.
3. **Extent**
   Predictions show a significant rise in frequency and intensity of heat waves, with inland areas being more susceptible.
4. **Vulnerability**
   Populations most vulnerable to extreme heat are elderly individuals, low-income communities, outdoor workers, people experiencing homelessness, and the access and functional needs community.
5. **Mitigation and Preparedness**
   To manage extreme heat, Los Angeles County has implemented cooling centers, urban greening initiatives, public awareness campaigns, and building codes and regulations.

6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

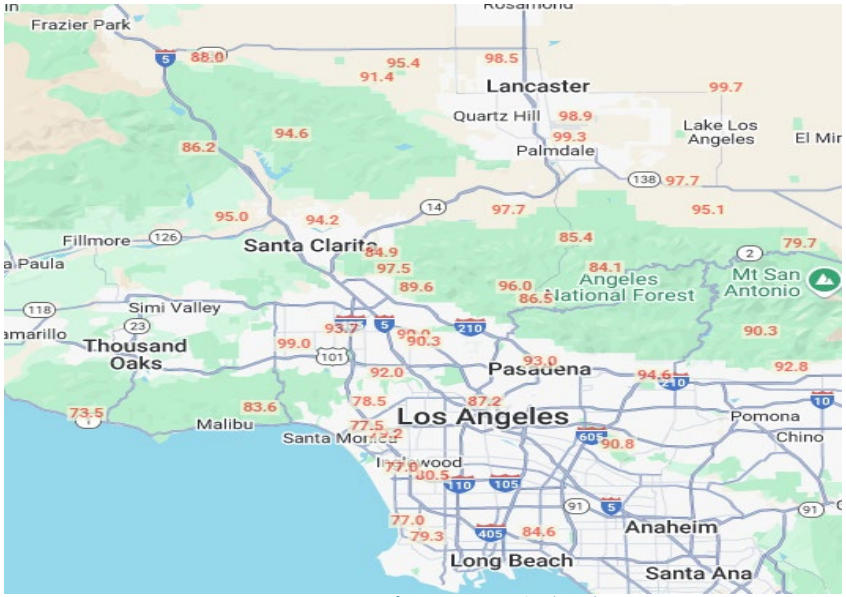


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.

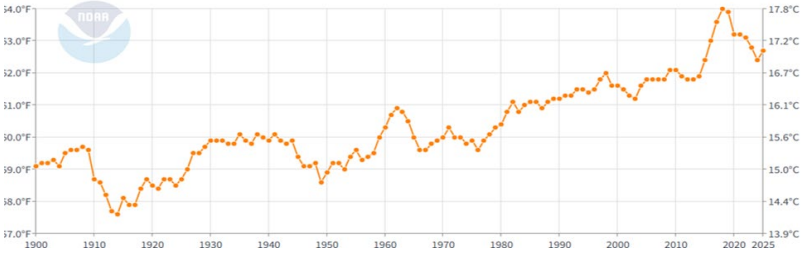


Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.

DROUGHT KEY POINTS

1. **Nature**
   Drought is a slow-developing hazard worsened by climate change, leading to hotter, drier conditions and water shortages.
2. **Location**
   L.A. County's drought risk is high due to its arid climate and dependence on imported water sources.
3. **Extent**
   Droughts are classified into five levels; L.A. experienced drought conditions for 376 straight weeks from 2011–2019.
4. **Vulnerability**
   All residents are affected by dought, especially vulnerable groups, face risks from water shortages, wildfires, and health impacts.
5. **Mitigation and Preparedness**
   The County is expanding recycling, stormwater capture, and conservation programs to improve drought resilience.

There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

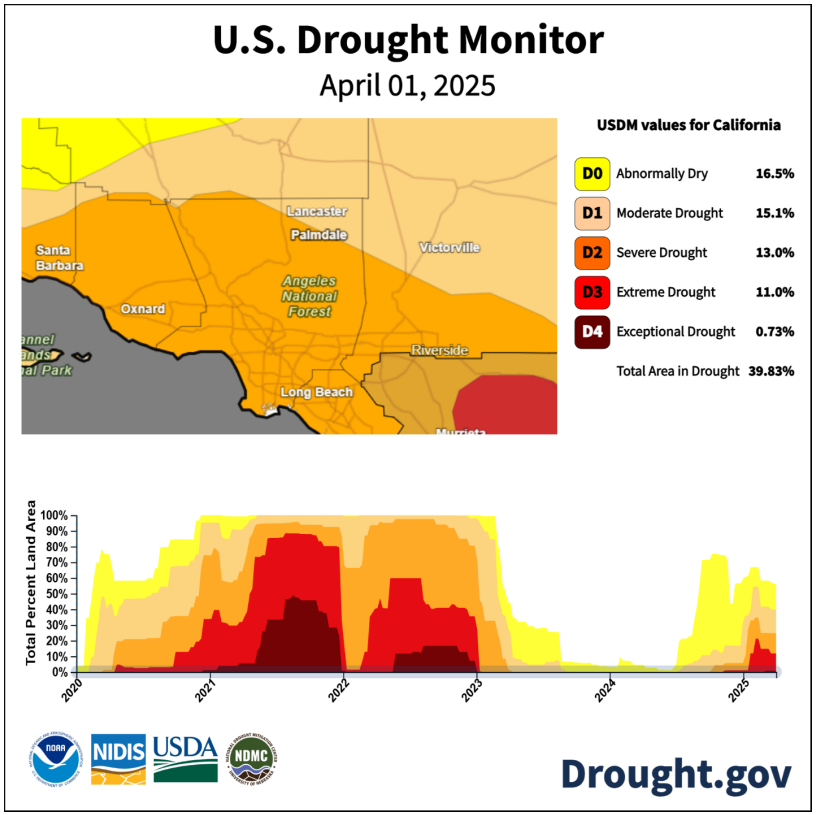


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

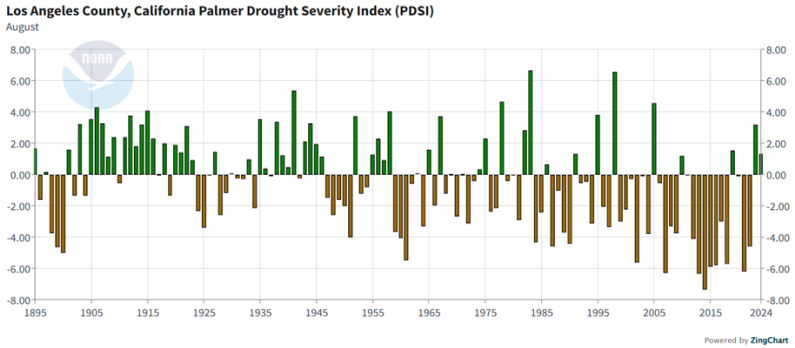


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.

Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

FLOODING KEY POINTS

1. **Nature**
   Flooding in Los Angeles County is driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels.
2. **Location**
   Areas at risk of flooding include communities near rivers, foothills, valleys, coastlines, and recent burn scars.
3. **Extent**
   Approximately 243.32 square miles of Los Angeles County are in a 500-year floodplain.
4. **Vulnerability**
   Residents within floodplains or people experiencing homelessness living near rivers are especially vulnerable to floods.
5. **Mitigation and Preparedness**
   Actions focus on floodplain land use regulations, stormwater management and drainage, and maintaining flood control measures.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

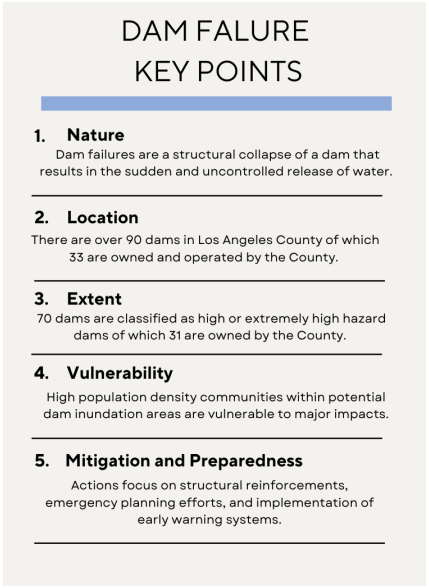
According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 223.88 sq mi (7.97%)
  - **SD1**: 162.25 sq mi (45.98%)
  - **SD2**: 66.57 sq mi (18.32%)
  - **SD3**: 25.76 sq mi (5.97%)
  - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
  - Fire Department: 112 (33.22%)
  - Public Works: 92 (40.00%)
  - Health Services: 29 (44.62%)
  - Public Health: 17 (42.50%)
  - Libraries: 30 (34.48%)
  - Parks: 65 (35.50%)
  - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.

LAND MOVEMENT KEY POINTS

1. **Nature**
   Land movement is the downward movement of rock, soil, or debris due to gravity.
2. **Location**
   Hillside, canyon, and coastal bluff communities along with areas near recent burn scars are at particular risk.
3. **Extent**
   Approximately 750 square miles (15.75%) of Los Angeles County are within high-risk landslide zones.
4. **Vulnerability**
   Approximately 1.2 million residents in Los Angeles County could be affected by land movement.
5. **Mitigation and Preparedness**
   Actions focus on regulating land use and strengthening infrastructure resilience.

Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

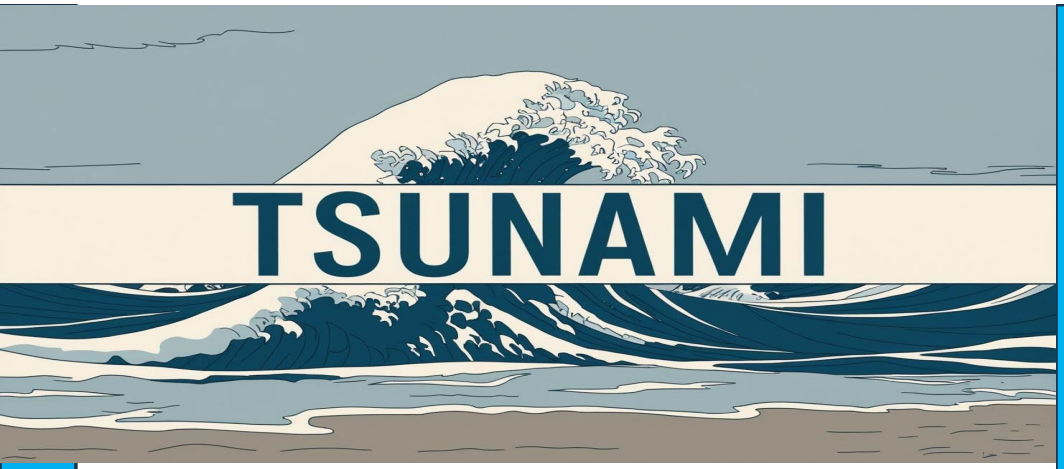
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

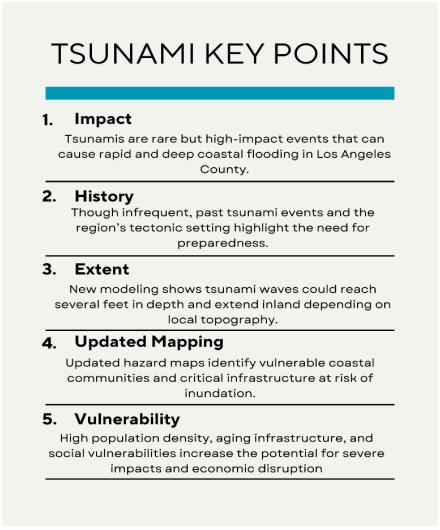
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.

WIND & TORNADO KEY POINTS

1. **Nature**
   Severe wind events such as Santa Ana winds and occasional tornadoes can cause widespread disruption, infrastructure damage, and increased wildfire risk
2. **Location**
   High-wind zones are common in canyon passes, valleys, and coastal regions, while tornadoes may occur sporadically throughout the county during severe storm activity.
3. **Extent**
   Santa Ana and storm-driven winds can exceed 80 mph; tornadoes in the area typically range from EF-0 to EF-1, with limited but impactful damage.
4. **Vulnerability**
   Critical infrastructure, older or poorly constructed buildings, wildfire burn scars, and residents with limited mobility are most at risk from high wind and tornado events.
5. **Mitigation and Preparedness**
   Strengthening building codes, retrofitting infrastructure, vegetation management, tornado-resistant construction, early warning systems, and public education.

Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

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

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

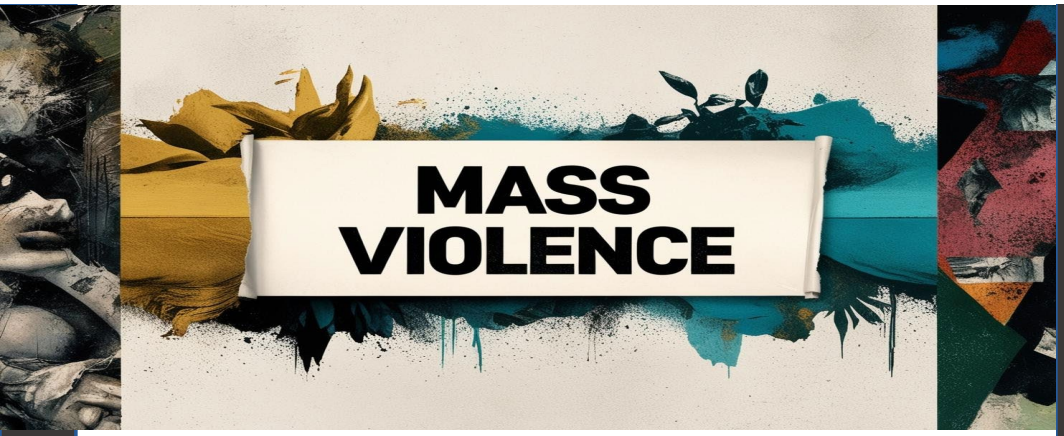
Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

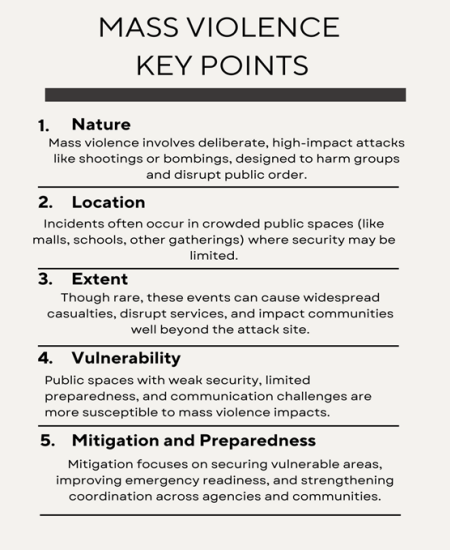
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

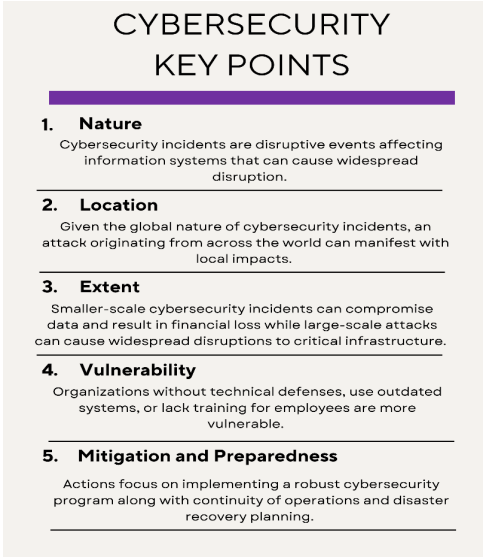
This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature

Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:



- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature

Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

PUBLIC HEALTH KEY POINTS

1. **Nature**
   Public health emergencies include pandemics, disease outbreaks, bioterrorism, and environmental hazards.
2. **Location**
   Highly populated counties face unique public health vulnerabilities.
3. **Extent**
   Public Health Emergencies can derive from local, regional, national, or global sources, affecting various communities.
4. **Vulnerability**
   Older adults, individuals with chronic health conditions, those with low income or experiencing homelessness, and others within the Access and Functional Needs (AFN) community face increased risks during public health emergencies
5. **Mitigation and Preparedness**
   Efforts include vaccinations, disease tracking, healthcare support, public education, emergency supplies, and agency coordination.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

County of Los Angeles
All-Hazards Mitigation Plan

7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

APPENDIX D

CITY OF POMONA WATER RATE STRUCTURE

RESOLUTION NO. 2019-127

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA APPROVING NEW RATE STRUCTURES FOR WATER AND RECYCLED WATER FEES AND SERVICE CHARGES AND INCREASING SEWER SERVICE FEES

WHEREAS, Chapter 62 of the Pomona City Code, Article IV, Municipal Water Utility, Section 62-195 and 62-291, establishes the City's ability to charge bimonthly fees for the supply of water and recycled water to customers within and outside the City of Pomona, and established the City Council's authority to set water and recycled water rates by resolution;

WHEREAS, Chapter 62 of the Pomona City Code, Article V, Sewer Disposal, Section 62-400, establishes the City's ability to charge bimonthly fees for sewer services to customers, and establishes the City Council's authority to set sewer service rates by resolution;

WHEREAS, this resolution adjusting water, recycled water, and sewer service rates shall apply only to Chapter 62 of the Pomona City Code, Article IV and V, Municipal Water Utility and Sewer Disposal, respectively;

WHEREAS, the City previously retained Raftelis Financial Consultants, an independent financial consultant to review the City's water, recycled water, and sewer utilities to determine whether rates for service charges are sufficient to meet increased costs of service, and to prepare a cost of service analysis and rate study (the "Study");

WHEREAS, based on the results of the Study (a copy of which is available for inspection at the office of the City Clerk, and was also posted on the City's website), increases to the rates for water, recycled water, and sewer service fees and charges are necessary;

WHEREAS, the proposed potable water rate structure includes a fixed service charge imposed on a bimonthly basis, and a commodity charge. The fixed service charge includes a meter service charge, determined based on the size of the meter serving the property (measured in inches), and recovers the cost to maintain and replace meters as well as a portion of extra-capacity related costs, and a customer service component, which is the same for all meters regardless of size. The proposed commodity charge is based on the amount of water consumed, measured in dollars per hundred cubic feet ("CCF") delivered to the property, and is divided into domestic and irrigation customer classes based on shared patterns of usage;

WHEREAS, the proposed potable water rate structure also includes fire service charges for certain properties in the City that have private fire service meters installed, and which is charged based on the size of the fire meter serving the property;

WHEREAS, the proposed recycled water rate structure includes a commodity charge, which is determined based on the number of acre feet of recycled water delivered to a property, and a bimonthly recycled water service charge, based on the size of the recycled water meter serving the property;

WHEREAS, the proposed sewer service charges include a bimonthly service charge, which is uniform for all customers, and a consumption charge, which is applied per unit of water consumption defined as the average of two complete months data within the period of December of the previous year through the following March;

WHEREAS, the proposed rate structures are for a period of five years, and are proposed to take effect October 1, 2019, and to increase each January 1 thereafter commencing January 1, 2020, through and including January 1, 2023;

WHEREAS, the proposed potable water, recycled water, and sewer service fees (collectively, the "Fees") are property-related fees within the meaning of article XIII D of the California Constitution;

WHEREAS, the revenues derived from the Fees will not exceed the funds required to provide the services for which the Fees are imposed, and will be used exclusively for the operation and maintenance of the City's potable water, recycled water, and sewer systems;

WHEREAS, the Fees are equitable to all customer classes;

WHEREAS, the amount of the Fees will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition;

WHEREAS, the Fees will not be imposed on a parcel unless the service for which such Fees are imposed, is actually used by, or immediately available to, the owner of the parcel;

WHEREAS, article XIII D, section 6 of the California Constitution ("Article XIII D") requires that prior to imposing any increase to the Fees, the City shall provide written notice (the "Notice") by mail of the new or increased Fees to the record owner of each parcel upon which the Fees are proposed for imposition and any tenant directly liable for payment of the Fees, the amount of the Fees proposed to be imposed on each parcel, the basis upon which the Fees were calculated, the reason for the Fees, and the date time and location of a public hearing (the "Hearing") on the proposed Fees;

WHEREAS, on July 19, 2019, the City distributed notices as required by Article XIII D regarding the City Council's consideration of the proposed rate adjustments to the Fees at the September 16, 2019, public hearing to all property owners of record and utility customers in accordance with Article XIII D, Section 6(a)(1) of the California Constitution, and Government Code Section 53755;

WHEREAS, on September 16, 2019, the City Council held a duly noticed public hearing on the proposed Fees contained in this Resolution, and at that time invited oral and written comments from the public;

WHEREAS, upon close of said public hearing, the City did receive __0__ written protests to the proposed Fees; and

WHEREAS, the City Council now desires to establish rates for the Fees, effective October 1, 2019, at the rates and subject to increases on the dates set forth in the schedules included as Exhibit A hereto.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. That the adoption of this Resolution falls within a statutory exemption from environmental review pursuant to sections 15273, 15060(c)(2) of the State Guidelines for Implementation of the California Environmental Quality Act (CEQA), which pertain to the establishment, modification, structuring, restructuring, or approval of rates and charges by public agencies which the public agency finds are for the purpose of meeting operating expenses, and pertain to activities that will not result in a direct or reasonably foreseeable indirect change to the environment and that are not defined as a project under CEQA Regulations.

SECTION 2. That after considering the material presented in the Study, the City Council hereby finds as follows:

(a) Revenues derived from the Fees do not exceed the funds required to provide the property related service;
(b) Revenues derived from the Fees are not used for any purpose other than for which the Fees or charges is imposed;
(c) The amount of the Fees imposed upon any parcel or person does not exceed the proportional cost of service attributable to the parcel;
(d) The Fees are imposed for services that are actually used by, or immediately available to, the owner of the property upon which the Fees are imposed.

SECTION 3. That after receiving public comment and testimony on the new fee structure for water, sewer and recycled water services provided, and absent a majority protest to the proposed fee increases, the new fee schedule for water, sewer and recycled water fees and charges are hereby approved as set forth in Exhibit "A" attached hereto and incorporated herein by this reference.

SECTION 4. That the new fee schedule for water, sewer and recycled water services shall be implemented beginning October 1, 2019, and shall be increased annually on the dates set forth in Exhibit "A" hereto, up to the maximum rates set forth in Exhibit "A" hereto. To the extent any other resolution of the City conflicts with the provisions set forth herein, it is the explicit intent of the City Council that the provisions of this Resolution shall supersede.

SECTION 5. That all water charges subject to the adjusted fee schedule may resume annual CPI adjustment, as outlined in City Code Section 62-271, starting on January 1, 2024.

SECTION 6. The City Clerk shall attest and certify to the passage and adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 16th day of September, 2019.

CITY OF POMONA:

Tim Sandoval
Mayor

APPROVED AS TO FORM:

Sonia Carvalho Reso 2019-127
Sonia Carvalho
City Attorney

ATTEST:

Rosalia A. Butler, MMC
City Clerk

I, HEREBY CERTIFY that the foregoing resolution was duly adopted by the City Council of the City of Pomona at a regular meeting thereof held on September 16, 2019 by the following vote of the Council:

AYES:	Garcia, Gonzalez, Lustro, Ontiveros-Cole, Preciado, Torres, Sandoval
NOES:	None
ABSTAIN:	None
ABSENT:	None

Rosalia A. Butler, MMC
City Clerk

Rate Schedule

Bimonthly Potable Water Service Charge

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
5/8"	$ 41.29	$ 45.52	$ 50.19	$ 55.33	$ 59.21
3/4"	$ 60.92	$ 67.17	$ 74.05	$ 81.64	$ 87.35
1"	$ 100.18	$ 110.45	$ 121.77	$ 134.25	$ 143.65
1-1/2"	$ 198.33	$ 218.65	$ 241.07	$ 265.77	$ 284.38
2"	$ 316.10	$ 348.50	$ 384.22	$ 423.60	$ 453.26
3"	$ 590.91	$ 651.48	$ 718.25	$ 791.87	$ 847.31
4"	$ 983.49	$ 1,084.30	$ 1,195.44	$ 1,317.97	$ 1,410.23
6"	$ 1,964.95	$ 2,166.36	$ 2,388.41	$ 2,633.22	$ 2,817.55
8"	$ 3,142.70	$ 3,464.83	$ 3,819.97	$ 4,211.52	$ 4,506.33
10"	$ 4,516.75	$ 4,979.71	$ 5,490.13	$ 6,052.87	$ 6,476.57

Potable Water Commodity Rate Structure

Water Use	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
Domestic	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF
1-13 Units	$1.77	$1.95	$2.15	$2.37	$2.54
14-35 Units	$2.24	$2.47	$2.72	$3.00	$3.21
36 Units and Over	$2.36	$2.60	$2.87	$3.16	$3.38
Irrigation					
1-13 Units	$1.88	$2.07	$2.28	$2.51	$2.69
13-35 Units	$2.60	$2.87	$3.16	$3.48	$3.72
36 Units and Over	$2.65	$2.92	$3.22	$3.55	$3.80

Bimonthly Recycled Water Service Charge

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
2"	$ 63.22	$ 69.70	$ 76.84	$ 84.72	$ 90.65
3"	$ 118.18	$ 130.30	$ 143.65	$ 158.37	$ 169.46
4"	$ 196.70	$ 216.86	$ 239.09	$ 263.59	$ 282.05
6"	$ 392.99	$ 433.27	$ 477.68	$ 526.64	$ 563.51
8"	$ 628.54	$ 692.97	$ 763.99	$ 842.30	$ 901.27
10"	$ 903.35	$ 995.94	$ 1,098.03	$ 1,210.57	$ 1,295.31
12"	$ 1,963.33	$ 2,164.57	$ 2,386.43	$ 2,631.04	$ 2,815.22
14"	$ 2,944.78	$ 3,246.62	$ 3,579.40	$ 3,946.29	$ 4,222.53
16"	$ 3,926.24	$ 4,328.68	$ 4,772.37	$ 5,261.54	$ 5,629.85
18"	$ 4,907.70	$ 5,410.74	$ 5,965.34	$ 6,576.79	$ 7,037.17

Recycled Water Commodity Rate Structure (Cost Per Acre Foot)

October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
$ 566.47	$ 589.42	$ 546.92	$ 566.55	$ 587.74

Sewer Rates

	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
Bimonthly Service Charge	$ 9.39	$ 9.96	$ 10.56	$ 11.19	$ 11.75
Rate Per Unit of Consumption	$ 0.70	$ 0.74	$ 0.78	$ 0.83	$ 0.87

Fire Service Rates

Size	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
2" or less	$ 8.64	$ 9.53	$ 10.50	$ 11.58	$ 12.39
3"	$ 25.10	$ 27.67	$ 30.51	$ 33.63	$ 35.99
4"	$ 53.48	$ 58.96	$ 65.01	$ 71.67	$ 76.69
6"	$ 155.36	$ 171.28	$ 188.84	$ 208.19	$ 222.76
8"	$ 331.07	$ 365.00	$ 402.41	$ 443.66	$ 474.72
10"	$ 595.37	$ 656.40	$ 723.68	$ 797.86	$ 853.71
12"	$ 961.69	$ 1,060.27	$ 1,168.95	$ 1,288.76	$ 1,378.97

RESOLUTION NO. 2019-128

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA CHANGING WATER RATES FOR TEMPORARY CONTRACTOR METER WATER USAGE AND SETTING AVAILABILITY PRICING FOR WHOLESALE RECYCLED WATER CUSTOMERS SELLING WATER OUTSIDE THE AREA SERVED BY THE CITY

WHEREAS, Chapter 62 of the Pomona City Code, Article IV, Municipal Water Utility, Section 62-297 establishes the City's ability to charge fees for the temporary supply of water through construction water meters and the City Council's authority to set water services by resolution;

WHEREAS, this resolution adjusting rates for water for temporary service for contractors shall apply only to Chapter 62 of the Pomona City Code, Article IV, Municipal Water Utility;

WHEREAS, a notice of the September 16, 2019, public hearing on the proposed rate adjustments was published in the Inland Valley Daily Bulletin on September 6 and September 13, 2019;

WHEREAS, for each fee, the City completed a cost of service study and has determined the rates are appropriate;

WHEREAS, the supply of water for temporary service for contractors shall be subject to a surcharge, and added to the amount of water used in each tier, equal to that levied upon the City by the Metropolitan Water District and/or other suppliers of imported water as a part of their water conservation plan as constituted or as modified;

WHEREAS, the City is the purveyor of potable, nonpotable and recycled water within its service area and has a contract with the Sanitation District of Los Angeles County to receive 2/3 of the recycled water produced at the District's Pomona Wastewater Treatment Plant;

WHEREAS, the City can act as a wholesaler and supply recycled water to customers who later supply said water to users outside of the area served by the City;

WHEREAS, the City can supply water to customers who utilize recycled water in areas not serviced by the City and served by another water provider;

WHEREAS, the City's primary objective is to supply recycled water to recycled water customers within the area served by the City;

WHEREAS, in the summer there may be times when recycled water available to the City is insufficient to meet demands, in such instances the City must mix potable water into the recycled water system, which substantially increases the cost for providing recycled water;

WHEREAS, when the demand for recycled water reaches the threshold that requires potable water be used to increase available recycled water, threshold rates will apply to any customer who uses recycled water to sell for use outside of the area served by the City. All users in the area served by City will continue to be charged the applicable rate, depending on usage;

WHEREAS, this resolution delineates how recycled water will be allocated to City customers and what rate each customer will be billed for the water they receive;

WHEREAS, the rates established pursuant to this resolution are imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of providing the service or product, and the cost of service analysis supporting the rates is on file with the City Clerk and available for inspection.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. The adoption of this Resolution falls within a statutory exemption from environmental review pursuant to sections 15273, 15060(c)(2) of the State Guidelines for Implementation of the California Environmental Quality Act (CEQA), which pertain to the establishment, modification, structuring, restructuring, or approval of rates and charges by public agencies which the public agency finds are for the purpose of meeting operating expenses, and pertain to activities that will not result in a direct or reasonably foreseeable indirect change to the environment and that are not defined as a project under CEQA Regulations;

SECTION 2. That after review of cost of service analysis for providing water services, and the financial analysis of the water and sewer utility funds, the Council had determined that the new rates for the services provided below are reasonable and justified and are hereby approved as set forth below.

Bimonthly Temporary Construction Water Service Charge (Potable Water)

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
1"	$ 100.18	$ 110.45	$ 121.77	$ 134.25	$ 143.65
3"	$ 590.91	$ 651.48	$ 718.25	$ 791.87	$ 847.31

Temporary Construction Water Commodity Rate Structure (Potable Water)

Water Use		October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
Tiers		Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF
1	1-13 Units	$ 1.77	$ 1.95	$ 2.15	$ 2.37	$ 2.54
2	14-35 Units	$ 2.24	$ 2.47	$ 2.72	$ 3.00	$ 3.21
3	36 Units and Over	$ 2.36	$ 2.60	$ 2.87	$ 3.16	$ 3.38
	Imported Water Conservation Charge	$ -	$ -	$ -	$ -	$ -

Bimonthly Temporary Construction Water Service Charge (Recycled Water)

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
1"	$20.04	$22.09	$24.35	$26.85	$28.73
3"	$ 118.18	$ 130.30	$ 143.65	$ 158.37	$ 169.46

Temporary Construction Water Commodity Rate Structure (Recycled Water)

Water Use	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF
CCF Units	$ 1.30	$ 1.35	$ 1.26	$ 1.30	$ 1.35

Contractors shall provide a refundable deposit for construction meters at the rates shown below. Additionally, the City shall collect an advance payment equal to the rate of a single bimonthly service charge at the requested meter size and type of water to be utilized and 55 CCF at the then current rate, said deposit and advance payment is to guarantee payment for all water used and return of the meter. Lost, stolen or damaged meters are the responsibility of the contractor and will be repaired or replaced at the determination of the City.

Deposit amount:

1 Inch Meter- $288.00
3 Inch Meter- $1,031.00

SECTION 3. The water rates and service charges amended by this five-year rate adjustment plan will resume annual CPI adjustment, effective January 1st of each year, as outlined in City Code Section 62-271, starting on January 1, 2024.

SECTION 4. The City shall bill recycled water customers who are reselling City water, or utilizing recycled water outside the area served by the City, based on the following criteria:

Phase I. When there is sufficient recycled water available to meet needs of recycled water customers within the area served by the City, the City will charge the City's rates then in effect for retail recycled water service based on the meter size and recycled water consumption.

Phase II. When recycled water is insufficient to meet the needs of the City's retail recycled water customers, and the City is required to supplement the recycled water system by adding potable water to the recycled water system to meet recycled water demands, the City's Tier 3 rates then in effect for potable water service charges will be charged for the potable water added to the recycled water system and sold outside of the area served by the City. To determine the billing for the amount of potable water used, the City will use the following criteria.

When potable water is added to the recycled water system to meet wholesale demands, the City will sum all wholesale meter consumptions and subtract the potable water added, giving the volume recycled water provided to the

system. The recycled water volume will then be divided by the number of wholesale customers, and subtracted from their wholesale meter read volume, thereby providing the portion of potable water added to the system to meet their demands. Once this is determined, the City will invoice each customer for their portion of recycled water and potable water at the appropriate current rate.

If the total wholesale billings is less than the potable water delivered to the recycled water system in a billing cycle, customers will be billed at the then current tier 3 potable water rate for all water used.

If a wholesale customer does not fully use their portion of recycled water per billing cycle, the unused recycled water will be evenly distributed to the other wholesale recycled water customers.

Phase III. If the Water Resources Department determines that there is insufficient recycled water for wholesale use, based on the City's inability to obtain enough recycled water to keep up with system demands, the Department shall notify impacted customers as soon as possible and discontinue providing said recycled water. Once recycled water becomes available, customers shall be notified and sales shall resume as the Department is able to do so, at the then current rate.

SECTION 5. The fees and charges set forth herein shall become effective on October 1, 2019, and shall be adjusted as set forth in Sections 2 and 3 hereof. All resolutions or administrative actions by the City Council, or parts thereof that are inconsistent with any provision of this Resolution are hereby superseded only to the extent of such inconsistency.

SECTION 6. The City Clerk shall attest and certify to the passage and adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 16th day of September, 2019.

CITY OF POMONA:

Tim Sandoval
Mayor

APPROVED AS TO FORM:

Sonia Carvalho Reso 2019-128
Sonia Carvalho
City Attorney

ATTEST:

Rosalia A. Butler, MMC
City Clerk

I, HEREBY CERTIFY that the foregoing resolution was duly adopted by the City Council of the City of Pomona at a regular meeting thereof held on September 16, 2019 by the following vote of the Council:

AYES:	Garcia, Gonzalez, Lustro, Ontiveros-Cole, Preciado, Torres, Sandoval
NOES:	None
ABSTAIN:	None
ABSENT:	None

Rosalia A. Butler, MMC
City Clerk

EXECUTIVE ORDER

The fees set by Resolution No. 2019-128 have been set in compliance with Division 5 of Chapter 2 of the Pomona City Code pertaining to the fixing of regulatory fees and service charges. Pursuant to Section 2-924(d) of the Pomona City Code, the fee schedule set by Resolution No. 2019-128 shall take effect ten (10) days after the signing of an Executive Order if no written appeal has been filed.

for

Mayor Tim Sandoval

Date: Sep. 18, 2019