CITY OF FULLERTON

LOCAL HAZARD MITIGATION PLAN

Michael Baker INTERNATIONAL | *We Make a Difference*

2026

CITY OF FULLERTON

LOCAL HAZARD MITIGATION PLAN

2026

Michael Baker INTERNATIONAL

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF CONTENTS

1 INTRODUCTION

WHAT'S DIFFERENT ABOUT THE 2026 PLAN?

- Alignment with updated guidance from the 2025 FEMA Local Mitigation Planning Policy Guide, effective April 2025.
- Additional considerations included for climate change, changes in vulnerability due to changes in population and development, and limited adaptive capacity and access and functional needs populations.
- Document organization and structure updates: outlining the Planning Process as its own chapter, and combining the previous Hazard Assessment and Threat Assessment chapters into Chapter 4: Hazards Assessment.
- Review and confirmation of previously identified mitigation goals.

SECTION 1: INTRODUCTION AND PURPOSE

The City of Fullerton (City) strives to reduce hazards and improve resilience through capital improvement projects, innovative planning, and emergency management practices. The City has developed this 2026 City of Fullerton Hazard Mitigation Plan (LHMP) update in an effort to reduce future loss of life and property damage, resulting from natural or human-caused hazards.

Natural and human-caused hazards can cause significant damage to communities, businesses, public infrastructure, and the environment. The impacts to residents and businesses within communities can be immense, and infrastructure damage can result in regional, economic, and public health consequences. Municipal buildings and critical infrastructure are vulnerable to a variety of hazards that can result in damaged structures, loss of power, disruption to operations and services, contaminated natural resources, and revenue losses. By planning for natural and human-caused hazards, and implementing projects that mitigate risk, cities can reduce costly damage and improve reliability of service following a disaster incident.

Previously, the City prepared the 2020 LHMP to implement a hazard mitigation strategy within the community. This LHMP was active until May 21, 2025. Thus, this 2026 iteration of the plan serves as a comprehensive hazard mitigation plan update.

No community can be protected against all potential impacts from natural or human-caused hazards, and hazard events often result in periods of emergency response and recovery before returning to "normal" operations. However, communities can reduce potential impacts by taking actions to become more resilient. This LHMP provides a blueprint for the City to reduce threats posed by hazards that may impact people, infrastructure, or operations. Proper planning, prior to a natural or human-caused disaster, will allow the City to return to "normal" sooner, with fewer impacts and disruption to the community.

1.1 PLAN PURPOSE

The purpose of this LHMP is to provide City staff and City leaders with clear direction for hazard mitigation action planning.

This LHMP identifies natural and human-caused hazards that threaten City infrastructure, operations and people. This LHMP also provides resources, information, and strategies to reduce these risks.

Hazard mitigation plays an important role in reducing disaster impacts by identifying effective and feasible actions to reduce the risks posed by potential hazards before an occurrence. This plan has been developed and updated to be consistent with current standards and regulations, ensuring the understanding of hazards facing the community reflects the best available information and present-day conditions.

The LHMP does not supersede any internal plans or strategies. Rather, the LHMP enhances the ability of the City to identify, inform, and mitigate hazard risks unique to Fullerton. Information in this LHMP will be used to help guide and coordinate mitigation actions and serve as a tool for City decision-makers to specifically direct mitigation activities and resources.

This LHMP incorporates the latest policy guidance from the Federal Emergency Management Agency (FEMA) Local Mitigation Planning Policy Guide, effective April 11, 2025.

1.2 PLAN AUTHORITY

FEDERAL

The federal Robert T. Stafford Disaster Relief and Emergency Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000 (DMA 2000) and supported by various regulations, directs hazard mitigation planning activities, including creation of this plan. The Stafford Act requires State, local, and tribal governmental entities that wish to be eligible for federal hazard mitigation grant funds to submit a hazard mitigation plan, identifying the natural and man-made hazards, risks, and vulnerabilities of each jurisdiction (United States Code [USC] Title 42, Section 5156[a]). FEMA has promulgated Code of Federal Regulations (CFR) Title 44, Part 201 to carry out the hazard mitigation planning requirements in the Stafford Act. These regulations direct the planning process, plan content, and FEMA approval of hazard mitigation plans. This LHMP complies with the Stafford Act and DMA 2000, along with the appropriate sections of Title 44 of the CFR, including parts 201, 206 and 322.

STATE

California Government Code Section 8685.9 (Assembly Bill [AB] 2140) limits the State of California's share of disaster relief funds paid out to local governments to 75 percent of the funds not paid for by federal disaster relief efforts, unless the jurisdiction has adopted a valid hazard mitigation plan consistent with DMA 2000. This LHMP is consistent with current standards and regulations, as outlined by Cal OES. It uses the best available information, and its mitigation actions reflect best practices and community values. This LHMP meets the requirements of current State and federal guidelines and ensures the City of Fullerton is eligible for all appropriate benefits under State and federal law and practices. This LHMP has been prepared to meet FEMA and Cal OES requirements, thus making the City eligible for funding and technical assistance from State and federal hazard mitigation programs.

1.3 PLAN ADOPTION

Following FEMA approval of the LHMP, the Fullerton City Council will formally adopt the LHMP. Copies of the resolution are provided in Appendix A, *City of Fullerton Adoption Resolution*.

1.4 PLAN ORGANIZATION

The LHMP is organized into seven sections to reflect the logical progression of activities undertaken to develop a hazard mitigation strategy, and includes all relevant documentation required to meet the necessary criteria for FEMA approval. Each section is described briefly below.

Section 1.0: Introduction and Purpose describes the background and purpose of the LHMP, as well as the authority established for its development.

Section 2.0: Planning Process describes the LHMP planning process, as well as the meetings and outreach activities undertaken to engage City officials and staff, stakeholders, and members of the public.

Section 3.0: Community Profile provides the history, geography, demographics, and socioeconomics of the City of Fullerton, including land use and development trends. This section also evaluates social vulnerability through a variety of environmental justice indices and identifies applicability to the planning area.

Section 4.0: Hazards Assessment identifies and profiles the natural and human-caused hazards affecting the City, identifies the vulnerability and risk associated with each hazard, and provides a vulnerability assessment to critical facilities in relation to each of those hazards.

Section 5.0: Mitigation Strategy identifies the mitigation strategy and actions to reduce potential risks to the City's critical facilities, residents, and business owners and assesses the City's capabilities to implement and achieve the objectives of the mitigation actions.

Section 6.0: Plan Maintenance and Capabilities discusses implementation of the Plan, including the process to monitor, evaluate, update, and maintain the LHMP, and identifies opportunities for continued public involvement.

Section 7.0: References identifies the various resources utilized throughout the LHMP.

1.5 MITIGATION GOALS

The City has adopted the following goals for reducing disaster risk:

1. Reduce and isolate threats to public safety and property in Fullerton.
2. Maintain government operations and provisions of essential services to residents and stakeholders during and after a hazard event.
3. Protect the natural environment through responsible stewardship of air, water, and open spaces in Fullerton.
4. Promote resiliency and climate action in Fullerton through resilient infrastructure, responsive governance, and vibrant civic participation.
5. Partner with surrounding local, regional, state, and federal jurisdictions in hazard mitigation efforts.
6. Ensure hazard mitigation planning reflects the needs of the whole community, including individuals with limited adaptive capacity and access and functional needs.

1.6 CHANGES IN HAZARD MITIGATION PRIORITIES

The LHMP Planning Team found that the overall hazard mitigation goals from the previous plan remained accurate for current planning purposes, with one additional goal added to address inclusive planning for the whole community and individuals with access and functional needs.

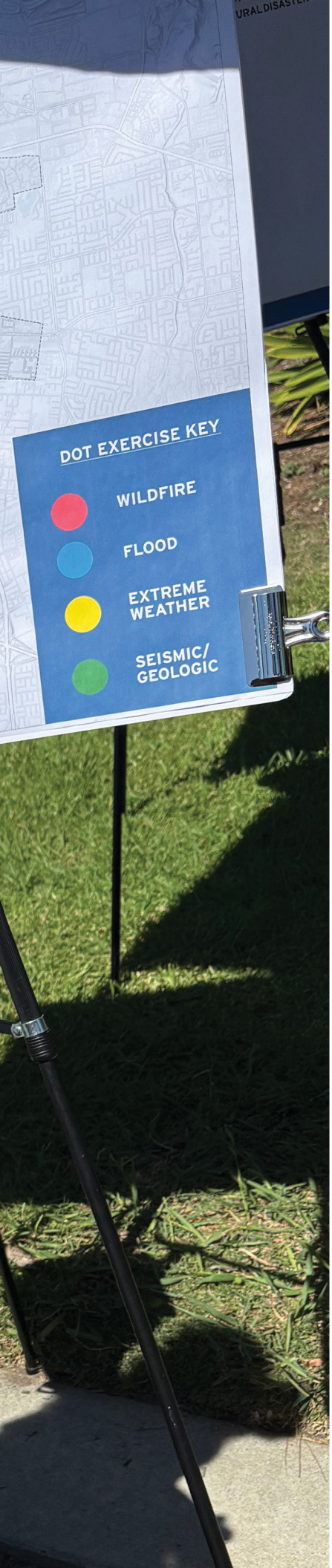
All hazards from the previous iteration of the LHMP were continued into this LHMP update. Some hazards were reorganized or combined for clarity and some hazards were expanded or renamed to reflect conditions more accurately for the City of Fullerton. The current LHMP incorporates changes and updates in hazard mitigation risk, vulnerability and priorities to reflect current trends and challenges.

Changes to the LHMP planning process were driven largely by the 2025 FEMA policy update. This LHMP update relied on the input of a cross section of representatives who participated on the LHMP Planning Team, including representatives from internal City departments and external stakeholders (neighboring jurisdictions, nonprofits/NGOs, public safety agencies, and others). This diverse representation on the LHMP Planning Team produced mitigation actions that consider a variety of perspectives across the planning area.

The LHMP Planning Team incorporated expanded considerations reflecting evolving conditions across the planning area. These included the growing impacts of climate change; shifts in vulnerability stemming from population growth, land use changes, and urban development; and the recognition of limited adaptive capacity among access and functional needs populations. These factors informed the prioritization of mitigation actions to ensure forward-looking strategies that address emerging risks and resilience.

Mitigation actions from the 2020 LHMP are discussed and reviewed in Section 5. Mitigation actions from the 2020 LHMP were identified as either completed or no longer relevant to the LHMP update. New mitigation actions are also highlighted in Section 5 and are generally organized by hazard type.

2 PLANNING PROCESS



WHAT'S DIFFERENT ABOUT THE 2026 PLAN?

- Community outreach included a wider range of stakeholders to consider the whole community, including individuals with access and functional needs.
- Public outreach efforts were increased through pop-up events, workshops, and engagement during standing City meetings and events.
- Virtual meetings were added to increase engagement.

SECTION 2: PLANNING PROCESS

This section describes each stage of the planning process used to develop the LHMP. This LHMP follows a prescribed series of planning steps which includes organizing resources, assessing risk, developing the mitigation strategy, drafting the plan, reviewing/revising the plan, and adopting and submitting the plan for approval. Each step is further described in this section.

Hazard mitigation planning in the United States is guided by statutory regulations described in the Disaster Mitigation Act of 2000 (DMA 2000) and implemented through Title 44 Code of Federal Regulations (CFR) Parts 201 and 206. FEMA hazard mitigation plan guidelines outline a four-step planning process for the development and approval of hazard mitigation plans. **Table 2-1: DMA 2000 CFR Crosswalk** lists the specific CFR excerpts that contain the requirements for approval and identifies the applicable section of this LHMP.

TABLE 2-1: DMA 2000 CFR CROSSWALK

DMA 2000 (44 CFR 201.6)	2026 LHMP PLAN SECTION
(1) Organize Resources	**Section 2**
201.6(c)(1)	Organize to prepare the plan
201.6(b)(1)	Involve the public
201.6(b)(2) and (3)	Coordinate with other agencies
(2) Assess Risks	**Section 4**
201.6(c)(2)(i)	Assess the hazard
201.6(c)(2)(ii) and (iii)	Assess the problem
(3) Develop the Mitigation Plan	**Section 5**
201.6(c)(3)(i)	Set goals
201.6(c)(3)(ii)	Review possible activities (actions)
201.6(c)(3)(iii)	Draft an action plan
(4) Plan Maintenance	**Section 6**
201.6(c)(5)	Adopt the plan
201.6(c)(4)	Implement, evaluate, and revise

2.1 ORGANIZING RESOURCES

The first step in the planning process involved organization of resources, including identifying the LHMP Project Management Team, convening the LHMP Planning Team, and reviewing background materials and documents.

2.1.1 LHMP PROJECT MANAGEMENT TEAM

The LHMP Project Management Team was responsible for day-to-day coordination of the LHMP work program, including forming and assembling the LHMP Planning Team; scheduling meetings; preparing, reviewing, and disseminating meeting materials; coordinating, scheduling, and participating in community engagement activities and meetings; and coordinating document reviews. The LHMP Project Management Team was led by Kristi Hofstetter Batiste, Emergency Manager with the Fullerton Fire Department.

The LHMP Project Management Team worked with the LHMP Consultant Team throughout the development of the LHMP. The LHMP Consultant Team consisted of hazard mitigation and planning professionals from Michael Baker International. The LHMP Consultant Team provided guidance and support to the City through facilitation of the planning process, data collection, community engagement, and meeting materials and document development.

2.1.2 LHMP PLANNING TEAM

The LHMP Project Management Team worked with the LHMP Consultant Team to identify stakeholders to participate in the LHMP. Stakeholders included representatives from internal City departments, along with several external entities including neighboring jurisdictions, utilities, professional organizations, community-based organizations, schools/academia, and other non-profits/NGOs. The LHMP Project Management team carefully selected stakeholders to represent a cross section of relevant community lifelines. Community lifelines are defined by FEMA as a fundamental service in the community that, when stabilized, enable all other aspects of society. When disrupted, decisive intervention (e.g., rapid service re-establishment or employment of contingency response solutions) is required. Community lifelines are categorized as follows:

- Safety and Security: Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety.
- Food, Hydration, Shelter: Food, Hydration, Shelter, Agriculture.
- Health and Medical: Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management.
- Energy: Power Grid, Fuel.
- Communications: Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch.
- Transportation: Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime.
- Hazardous Materials: Facilities, HAZMAT, Pollutants, Contaminants. Water Systems: Potable Water Infrastructure, Wastewater Management.

PLANNING PROCESS AT A GLANCE

The LHMP public outreach process was specifically designed to maximize participation and input from all community members, including individuals with access and functional needs.

60
Stakeholders

3
Outreach Events

280+
Survey Responses Received

7
Stakeholder Meetings

14
Day Public Comment Period

Stakeholders were notified via email, advising the City's efforts to prepare an updated LHMP and requesting their involvement in preparation of the Plan, including an invitation to attend the LHMP Planning Team meetings. The list of stakeholders included in this notification effort are summarized in **Table 2-2: LHMP Planning Team and Community Lifelines** below.

TABLE 2-2: LHMP PLANNING TEAM AND COMMUNITY LIFELINES

AGENCY OR UTILITY NAME	COMMUNITY LIFELINE
Local and Regional Agencies Involved in Hazard Mitigation Activities	
City of Fullerton	Government Service
Orange County Sheriff's Department (OCSD) – Emergency Management Division	Government Service
CAL TRANS	Transportation
US Army Corps of Engineers (USACE)	Communications
Fullerton Airport	Transportation
Water Emergency Response Organization of Orange County (WEROC)	Government Service; Food, Hydration, Shelter; Water Systems
Orange County Sanitation District (OC San)	Government Service; Health and Medical
Orange County Transportation Authority (OCTA)	Transportation
Orange County Water District (OCWD)	Food, Hydration, Shelter; Water Systems
Agencies with Authority to Regulate Development	
City of Fullerton	Government Service
Agencies of Neighboring Communities	
City of Anaheim	Government Service
City of Brea	Government Service
City of Buena Park	Government Service
City of Placentia	Government Service
City of La Habra	Government Service
City of La Mirada	Government Service
Representatives of Business, Academia, and other Private Organizations	
Southern California Edison (SoCal Edison)	Energy; Communications
Southern California Gas Company (SoCal Gas)	Energy
California State University, Fullerton	Government Service; Safety and Security
Fullerton College	Government Service; Safety and Security
Fullerton Joint Union High School District	Government Service; Safety and Security
Fullerton School District	Government Service; Safety and Security
Hope International University	Safety and Security
Marshall B. Ketchum University	Safety and Security
Rosary Academy	Safety and Security
BNSF Railway	Transportation
Amtrak	Transportation
North Orange County Chamber of Commerce	Communications
St. Jude Medical Center	Health and Medical
Representatives of Nonprofit Organizations/Community Based Organizations	
HOPE Center*	Safety and Security; Food, Hydration, Shelter
Braille Institute	Safety and Security

AGENCY OR UTILITY NAME	COMMUNITY LIFELINE
Dale McIntosh Center*	Safety and Security; Food, Hydration, Shelter
Stables V & H	Food, Hydration, Shelter
Tara's Chance	Food, Hydration, Shelter
Fullerton Boys and Girls Club*	Safety and Security; Food, Hydration, Shelter
Solidarity*	Safety and Security; Food, Hydration, Shelter
Richman Center for Healthy Neighbors * (CSUF)	Safety and Security; Food, Hydration, Shelter
Pathways of Hope*	Safety and Security; Food, Hydration, Shelter
OC United*	Safety and Security; Food, Hydration, Shelter
Olive Community Services*	Safety and Security; Food, Hydration, Shelter
Fullerton Collaborative*	Safety and Security; Food, Hydration, Shelter
American Red Cross*	Safety and Security; Food, Hydration, Shelter; Health and Medical
YMCA*	Safety and Security; Food, Hydration, Shelter

*Indicates an LHMP Planning Team member that provides services to those with access and functional needs or other "high-risk" populations within the planning area.

In addition to external stakeholders, the LHMP Planning Team included City of Fullerton staff members, representing a diverse cross-section of departments and responsibilities. Members of the LHMP Planning Team represented the following City departments and divisions:

- Fire Department
- Police Department
- Public Works Department
- Community and Economic Development Department
- Parks and Recreation Department
- City Manager's Office
- City Clerk's Office

The LHMP Planning Team worked together to ensure the success of the planning process and is responsible for its implementation and future maintenance. The committee's key responsibilities included:

- Participation in LHMP Planning Team meetings
- Collection of valuable local information and other requested data
- Decision on plan process and content
- Development and prioritization of mitigation actions for the LHMP
- Review and comment on plan drafts

- Coordination and involvement in the public engagement process

Table 2-3: LHMP Planning Team identifies both LHMP Project Management Team and LHMP Planning Team members, along with their roles in plan development.

TABLE 2-3: LHMP PLANNING TEAM

NAME	TITLE/ROLE	ORGANIZATION	LHMP PLANNING TEAM ROLE
LHMP Project Management Team			
Kristi Hofstetter Batiste	Emergency Manager	Fullerton Fire Department	City Project Manager – Organization of LHMP Planning Team and meetings, development of and participation in community outreach, hazard identification, capabilities assessment, mitigation actions and prioritization, plan coordination and review.
Adam Loeser	Fire Chief	Fullerton Fire Department	City Project Director - Organization of LHMP Planning Team and meetings, development of and participation in community outreach, hazard identification, capabilities assessment, mitigation actions and prioritization, plan coordination and review.
LHMP Planning Team			
Stephen Bise	Director	Fullerton Public Works Department	Draft LHMP review.
John Miller	Division Chief	Fullerton Fire Department	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review, draft LHMP review.
Jose Arana	Captain - Operations Division Commander	Fullerton Fire Department	Draft mitigation action review, draft LHMP review.
Jon Fugitt	Deputy Chief	Fullerton Fire Department	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review.
Michael Meacham	Deputy Chief	Fullerton Fire Department	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review.
Pedram Gharah	Captain - Services Division Commander	Fullerton Police Department	Risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.

NAME	TITLE/ROLE	ORGANIZATION	LHMP PLANNING TEAM ROLE
Chris Schafer	Planning Manager	Fullerton Community and Economic Development Department	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review, draft LHMP review.
Jared Brekenfeld	Building Inspector	Fullerton Community and Economic Development Department	Risk assessment/ vulnerability discussion, draft mitigation action review.
Richard Armendariz	Assistant Director	Fullerton Public Works Department	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Christian Hernandez	Parks and Recreation Manager	Fullerton Parks and Recreation Department	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Eddie Manfro	Interim City Manager/Human Resources Director	Fullerton City Manager's Office	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review.
Daisy Perez	Assistant City Manager	Fullerton City Manager's Office	Project goals and objectives identification
Veronica Schilling	Emergency Preparedness Coordinator	St. Jude Medical Center	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Jordan Garcia	Executive Director	YMCA	Risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Andrew W. Gregson	President and CEO	North Orange County Chamber of Commerce	Draft mitigation action review.
Brett Ackerman	Executive Director	Fullerton Boys and Girls Club	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review.

NAME	TITLE/ROLE	ORGANIZATION	LHMP PLANNING TEAM ROLE
Bethany Anderson	Executive Director	Solidarity	Draft mitigation action review.
Iris Aguilar	Director	Richman Center for Healthy Neighbors (CSUF)	Draft mitigation action review, draft LHMP Review.
James Kennedy	Community Program Manager	Pathways of Hope	Draft mitigation action review.
Jay Williams	Executive Director	OC United	Draft mitigation action review.
Zainab Hussaini	Program Manager	Olive Community Services	Draft mitigation action review.
Debra Stout	Executive Director	Fullerton Collaborative	Draft mitigation action review.
Janine Wilmoth	Emergency Manager	City of Anaheim	Risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Lisa Keyworth	Emergency Preparedness Coordinator	City of Brea	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Lance Charnes	Emergency Services Coordinator	City of Buena Park	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review, draft LHMP review.
Patrick Powers	Emergency and Health Services Manager	City of Placentia	Project goals and objectives identification, hazard identification and prioritization, draft LHMP review.
Jennifer Duong	Emergency Services Coordinator	City of La Habra	Project goals and objectives identification, hazard identification and prioritization, draft mitigation action review, draft LHMP review.
Eric Villagracia	Project Manager	City of La Mirada	Risk assessment/ vulnerability discussion, draft LHMP review.
Eric Dalton	Emergency Management & Continuity Coordinator	California State University, Fullerton	Draft mitigation action review, draft LHMP review.
Margie Jimenez	Admin Support Assistant – CSUF PD	California State University, Fullerton	Draft mitigation action review, draft LHMP review.

NAME	TITLE/ROLE	ORGANIZATION	LHMP PLANNING TEAM ROLE
John Krok	Director of Campus Safety	Fullerton College	Project goals and objectives identification, hazard identification and prioritization, draft LHMP review.
Karl Zener	Assistant Superintendent, Administrative Services	Fullerton Joint Union High School District	Draft mitigation action review.
Helene Morris	Director of Administrative Services	Fullerton School District	Draft mitigation action review.
Justin Tune	Director of Campus Safety	Hope International University	Draft mitigation action review.
Jason Houston	Director of Campus Safety	Marshall B. Ketchum University	Draft mitigation action review.
Amanda Hurtado	Executive Administrative Assistant & HR Coordinator	Rosary Academy	Draft mitigation action review.
Michelle Anderson	Director of Emergency Management	Orange County Emergency Management Division (within OCSD)	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft LHMP review.
Gina Ayala	Public Affairs Director	Orange County Water District	Draft mitigation action review.
Nick Boonmag	Security and Emergency Preparedness	Orange County Transportation Authority	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft LHMP review.
Matt Ankley	Dept. Manager Sec. and Emergency Preparedness	Orange County Transportation Authority	Draft mitigation action review.
Krystal Aleman	Security & Emergency Planning Specialist	Orange County Sanitation District	Risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Tony Cardenas	Government Relations Manager	Southern California Edison (SoCal Edison)	Draft mitigation action review.
Blake Perez	Public Affairs Manager	Southern California Gas	Project goals and objectives identification, hazard identification

NAME	TITLE/ROLE	ORGANIZATION	LHMP PLANNING TEAM ROLE
		Company (SoCal Gas)	and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Gabriela Landeros	WEROC Specialist	WEROC	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.
Vicki Osborn	Director of Emergency Management	WEROC	Risk assessment/ vulnerability discussion, draft LHMP review.
Bill Maines	California Division Signal Manager	BNSF	Draft mitigation action review.
Shawn Steele	Amtrak Emergency Manager	Amtrak/BNSF	Project goals and objectives identification, hazard identification and prioritization, draft LHMP review.
Brendan O'Reilly	Airport Manager	Fullerton Airport	Draft mitigation action review, draft LHMP review.
Jeremy Buraglia	Realty Specialist, Civil Works Branch	US Army Corps of Engineers (USACE)	Draft mitigation action review.
Carlos Camacho	Construction Engineer	US Army Corps of Engineers (USACE)	Draft mitigation action review.
John Bybee	Supervisor, EOC Coordinator	CAL TRANS	Risk assessment/ vulnerability discussion, draft LHMP review.
Rex McConnell	Area Superintendent	CAL TRANS	Draft mitigation action review.
Arturo Herrera	District Hazardous Materials Manager	CAL TRANS	Draft mitigation action review.
Sarah Bernal	Operations Manager	HOPE Center	Draft mitigation action review.
Ana Downs	Interim Regional Director	Braille Institute	Draft mitigation action review.
BreeAnna Adner	Systems Change Advocate	Dale McIntosh Center	Project goals and objectives identification, hazard identification and prioritization, risk assessment/ vulnerability discussion, draft mitigation action review, draft LHMP review.

NAME	TITLE/ROLE	ORGANIZATION	LHMP PLANNING TEAM ROLE
Versa Harris	Owner & Caretaker	Stables V & H	Draft mitigation action review.
Matt Howell	Executive Director	Tara's Chance	Draft mitigation action review.

A series of LHMP Planning Team meetings and smaller focus group meetings were hosted during the LHMP update process. The LHMP Planning Team Meeting #1 was hosted during August 2025 to introduce the LHMP, outline the planning process, and discuss priority natural hazards for the plan. Stakeholders on the LHMP Planning Team were then invited to participate in focus group meetings, hosted from September 2025 to November 2025. Focus groups were either held with a single stakeholder or a group of stakeholders with similar responsibilities or interests. The meeting series was concluded with the LHMP Planning Team Meeting #2, hosted on December 2, 2025. The purpose of the conclusion meeting was to present vulnerability/risk assessment findings and present mitigation actions. The meeting series is summarized below in **Table 2-4: LHMP Planning Team and Focus Group Meeting Summary**.

Meetings were held both in-person and virtually via Microsoft Teams, to accommodate stakeholders near the City, distributed throughout the region, and remote staff serving on the LHMP Consultant team. Meeting materials, including PowerPoint presentations, sign-in sheets, agendas, notes, and other relevant handouts, are provided in Appendix B, *LHMP Planning Team Documentation*.

2.1.3 PUBLIC OUTREACH

A public outreach and engagement strategy was developed to maximize public involvement in the LHMP planning process. The LHMP public outreach strategy included a dedicated webpage, community survey, community outreach events and public review draft distribution, as described below; refer to Appendix B, *LHMP Planning Team Documentation*. The LHMP public outreach process was specifically designed to maximize participation and input from all community members, including underserved groups and individuals with access and functional needs.

WEBPAGE

A dedicated webpage was developed on the City's website for the LHMP planning process. The webpage provided information on the LHMP, and how the public can get involved in the planning process. Contact information was included for comments or questions via email. A link to complete the community survey was posted to encourage participation. The website was updated throughout the planning process and provided notifications and access to LHMP materials. The draft LHMP was also made available for public review on this webpage, available here: https://www.cityoffullerton.com/government/departments/fire.

TABLE 2-4: LHMP PLANNING TEAM AND FOCUS GROUP MEETING SUMMARY

DATE/TIME	MEETING	ATTENDEES	DISCUSSION ITEMS
July 15, 2025 1:00pm – 2:00pm	LHMP Kickoff Meeting	LHMP Planning Team (All)	• Introduction and Roles/Responsibilities • Project Overview, Objectives, and Schedule • LHMP Stakeholder Committee • Proposed Hazard List • Community Outreach • Data Collection and Background Information
August 27, 2025 2:00pm – 4:00pm	LHMP Stakeholder Meeting #1	LHMP Stakeholder Committee (All)	• Purpose and Requirements of the LHMP • LHMP Stakeholder Expectations • LHMP Planning Process • Planning for the Whole Community • Hazard Identification and Prioritization • Data Needs and Capabilities
September 3, 2025 10:30am – 12:00am	LHMP Focus Group Meeting #1	Internal Staff Members	• Risk/Vulnerability Discussion • Mitigation Action Discussion
November 3, 2025 2:00pm – 3:00pm	LHMP Focus Group Meeting #2	Representatives From Nonprofit Organizations, Non-Governmental Organizations (NGOs), And Academia	• Risk/Vulnerability Discussion • Mitigation Action Discussion
November 4, 2025 1:00pm – 2:00pm	LHMP Focus Group Meeting #3	Representatives From Emergency Management And Public Safety Agencies	• Risk/Vulnerability Discussion • Mitigation Action Discussion
November 4, 2025 2:00pm – 3:00pm	LHMP Focus Group Meeting #4	Representatives From Utility And Transportation Sectors, And Orange County Departments	• Risk/Vulnerability Discussion • Mitigation Action Discussion
December 2, 2025 3:00pm – 4:00pm	LHMP Stakeholder Meeting #2	LHMP Stakeholder Committee (All)	• Draft Mitigation Action Review • Draft LHMP Review • Community Outreach Summary

Virtual outreach on the City's website posted for the entirety of the LHMP development process allowed for maximum audience reach, including individuals with access and functional needs. Traditionally, virtual outreach has the ability to reach community members who may be unable to attend in-person meetings or hearings. Individuals can access all information at their own convenience and have the ability to communicate directly with City staff regarding questions or comments.

COMMUNITY SURVEY

A community survey was developed to obtain input from the community about various hazard mitigation topics. In addition to basic demographic information (e.g., zip code and age), the survey asked residents to identify specific safety concerns, including identifying what hazards they felt were most likely to impact their neighborhood or property. Participants were also asked what actions they had taken to be more resistant to hazards, and preferences for future communication methods from the City. A survey link was posted on the LHMP webpage and sent to all City staff, the City's local newspaper, Fullerton Buzz, and numerous social media outlets. A promotional video was posted to social media outlets promoting the LHMP community survey. A QR code was also distributed on a printed handout at the Boots Bash, Puptoberfest, OktoBOOfest, and Senior Dance outreach events (below). Members of the LHMP Planning Team also distributed the survey link to colleagues and constituents within their jurisdiction.

In addition to these efforts, the community survey was also advertised at the following events: Emergency Manager Kristi Hofstetter-Batiste advertised the survey at a City staff "Lunch & Learn" session; CERT volunteers distributed the survey at a City Farmer's Market event; City staff left survey handouts at City Hall and the City Community Center.

The survey was opened on August 4, 2025, and closed on December 18, 2025. A total of 290 responses were received, including 286 in English, three in Spanish and one in Korean. Input received was similar with feedback received in-person during the Boots Bash, Puptoberfest, and Senior Dance pop-up events, as outlined below. Survey respondents reported experiencing power outage/utility failure, heavy rain, severe winds and extreme heat with the most frequency within the City of Fullerton. Correspondingly, survey respondents also reported high levels of concern for power outage and extreme heat in the future. Wildfire and urban fire reported low incidents of previous occurrences, but survey respondents reported high level of concern for future incidents. Most survey respondents reported themselves to be "somewhat prepared" for future natural hazards or disasters, and reported actions such as anchoring furniture, installing smoke detectors, maintaining emergency preparedness kits, and drought/wildfire resistant landscaping. Recommendations for mitigation actions included landscaping and open space maintenance, community awareness and education, and infrastructure improvements.

Survey input directly influenced the final hazard rankings, provided in Section 4.0, *Hazard Assessment*. Further details received allow the City to better target future outreach and engagement activities regarding the LHMP. The survey specifically provides outreach to individuals with access and functional needs who may not have the capacity or ability to

attend in-person outreach events or hearings. A detailed community outreach summary is included in Appendix B, *LHMP Planning Team Documentation*.

FIGURE 2-1: COMMUNITY SURVEY FLYER

Michael Baker International, Inc.

POP-UP COMMUNITY OUTREACH

The City of Fullerton hosted three interactive pop-up booths focused on LHMP outreach and content from September 2025 to December 2025. The intent of these outreach events was to use the "Whole Community" approach and meet stakeholders and constituents at a convenient location during a regularly scheduled and free event. Descriptions and outreach pictures for each community outreach event have been outlined below. In addition to these events, LHMP community survey flyers were also distributed during Fullerton's OktoBOOfest event, as Michael Baker attended the event to host a booth for the ongoing Open Space and Environmental Justice Element updates.

Fullerton Boots Bash Pop-Up Booth

The first community outreach event was hosted at the City of Fullerton's Boots Bash event on Saturday, September 20, 2025, from 5:00pm – 7:00pm. In coordination with City staff, the consultant team set up a pop-up booth at the City's first annual Boots Bash event to receive community input on the LHMP. Participants had the opportunity to vote on high priority hazards and review informational boards on the LHMP update. Flyers advertising the community survey along with comment cards were also provided. Despite the warm weather, over 70 LHMP survey flyers were distributed and approximately 20-25 individuals stopped by the booth to discuss the LHMP update.

Fullerton Puptoberfest Pop-Up Booth

The second community outreach event was hosted at the City of Fullerton's Puptoberfest event on Saturday, October 11, 2025, from 12:00pm – 4:00pm. In coordination with City staff, the consultant team set up a pop-up booth at the City's annual Puptoberfest event to receive

community input on the LHMP. Participants had the opportunity to identify areas within the City that frequently experience flooding, wildfire, or other natural hazards. Participants also documented experiences with natural hazards within the City, along with comments for consideration on the LHMP. To engage with children at Puptoberfest, copies of the State Hazard Mitigation Plan (SHMP) coloring book and coloring supplies were available. The pop-up booth was strategically located next to the City's CERT booth, where participants could receive further information about emergency preparedness and pet safety. The Puptoberfest event was very well attended, allowing the consultant team to gather input from and distribute LHMP survey flyers to over 250 members of the community. Participants at the pop-up booth included those who reside in Fullerton or frequently visit, and hazard prioritization voting was accessible for participants of all ages.

At the Fullerton Puptoberfest Pop-Up Booth, participants identified areas susceptible to natural hazards within the City and provided feedback via comment cards.

Fullerton Senior Dance Pop-Up Booth

The final community outreach event was hosted at the City of Fullerton's weekly Senior Dance event on Tuesday, December 2, 2025, from 4:00pm – 7:00pm. In coordination with City staff, the consultant team set-up a pop-up booth at the City's weekly Senior Dance, hosted at the Community Center to receive input on the LHMP. Participants had the opportunity to provide experience with previous natural disasters within the City, along with comments for consideration in the LHMP. The consultant team had the opportunity to discuss the LHMP with every attendee at the senior dance, approximately 50 individuals. This also provided an opportunity to engage with individuals who may have access or functional needs, and recognized need additional outreach and support in the case of an emergency.

Results from these outreach events, along with the board illustrations, are documented in Appendix B, *LHMP Planning Team Documentation*. Feedback was generally consistent with the results from the community survey, with top hazards of concern remaining the same amongst all pop-up events. City staff were available to answer questions from the public regarding hazard mitigation and resilience related to the City.

In addition to the activities and informational boards, staff passed out informational postcards describing the LHMP Update process containing the Community Survey QR Code to provide them with the opportunity to give additional input. An illustration of this handout is included above as **Figure 2-1: Community Survey Flyer**.

PUBLIC REVIEW DRAFT LHMP

A draft of the LHMP was made available on the LHMP webpage for the public to review and comment for a two-week period Notification of the draft LHMP availability for review and

comment was distributed via the City's website and email listservs. No comments were received on the draft LHMP. Documentation of this process is included in Appendix B, *LHMP Planning Team Documentation*.

2.1.4 REVIEW AND INCORPORATE EXISTING INFORMATION

The LHMP Planning Team referenced a variety of plans, studies, data, and technical reports available from local, State, and federal sources to prepare the LHMP update. Primary sources were reviewed and incorporated as part of the LHMP planning process, and are listed in **Table 2-5: Existing Plans, Studies, Reports, and Other Technical Data/Information**. A complete list of references is included in Section 7.0, *References*.

TABLE 2-5: EXISTING PLANS, STUDIES, REPORTS, AND OTHER TECHNICAL DATA/INFORMATION

EXISTING PLANS, STUDIES, REPORTS	PLANNING PROCESS/AREA OF DOCUMENT INCLUSION
2020 City of Fullerton Local Hazard Mitigation Plan	Multiple Plan Elements; Hazard Profiles
2012 City of Fullerton General Plan	Multiple Plan Elements
2024 City of Fullerton Emergency Operations Plan	Multiple Plan Elements
2025 City of Fullerton Capital Improvement Program	Multiple Plan Elements; Mitigation Strategy
2020 City of Fullerton Safety Element	Multiple Plan Elements
2025 City of Fullerton Water Master Plan	Hazard Profiles
2020 City of Fullerton Urban Water Management Plan	Hazard Profiles
2020 City of Fullerton Water Shortage Contingency Plan	Hazard Profiles
2021-2029 City of Fullerton Housing Element	Multiple Plan Elements
NFIP Regulatory Flood Mapping Products	Hazard Profiles

2.2 ASSESS RISKS

In accordance with FEMA requirements, the LHMP Planning Team identified and prioritized the hazards affecting the City and assessed vulnerability from those hazards. Results from this phase of the LHMP planning process aided subsequent identification of appropriate mitigation actions to reduce risk from these hazards; refer to Section 5.0, *Mitigation Strategy*.

2.2.1 IDENTIFY/PROFILE HAZARDS

Based on a review of past hazards, as well as a review of existing plans, reports, and other technical studies, data, and information, the LHMP Planning Team determined which specific hazards could affect the City. Content for each hazard profile is provided in Section 4.0, *Hazard Assessment*.

2.2.2 ASSESS VULNERABILITIES

Hazard profiling exposes the unique characteristics of individual hazards and begins the process of determining which areas within the City are vulnerable to specific hazards. The vulnerability assessment includes input from the LHMP Planning Team and a GIS overlaying method to map hazard risk assessments. Using these methodologies, critical facilities impacted by hazards were identified and potential loss estimates were determined, where available. Detailed information on the vulnerability assessments for each hazard is provided in Section 4.0, *Hazard Assessment*.

2.3 DEVELOP MITIGATION PLAN

2.3.1 IDENTIFY GOALS

The LHMP Planning Team reviewed mitigation goals from the previous 2020 LHMP and made minor editorial edits for clarification. Hazard mitigation goals were discussed during Meeting #1, before finalization and incorporation into the LHMP. Mitigation Goals are included in Section 1.0, *Introduction*.

2.3.2 DEVELOP CAPABILITIES ASSESSMENT

A capabilities assessment is a comprehensive review of all mitigation capabilities and tools currently available to the City for mitigation action implementation, prescribed in the LHMP. The LHMP Planning Team identified the planning and regulatory; administrative and technical; financial; and education and outreach capabilities to implement mitigation actions, as detailed in Section 5.0, *Mitigation Strategy*.

2.3.3 IDENTIFY MITIGATION ACTIONS

As part of the LHMP planning process, the LHMP Planning Team worked to identify and develop mitigation actions, after which mitigation actions were prioritized as high, medium, or low. A detailed discussion of the identification and prioritization of mitigation actions, and the creation of the implementation strategy is provided in Section 5.0, *Mitigation Strategy*.

2.3.4 PLAN ADOPTION AND SUBMITTAL

This plan will be submitted to Cal OES and FEMA for review. Upon receiving "approvable pending adoption" notification from FEMA, this plan will be presented to the City for consideration and approval by the Fullerton City Council. If approved, a copy of the resolution will be provided in Appendix A, *City of Fullerton LHMP Adoption Resolution*.

2.3.5 PLAN MAINTENANCE

Plan maintenance procedures, found in Section 6.0, *Plan Maintenance*, include the measures the City will take to ensure the LHMP's continuous long-term implementation. The procedures also include the manner in which the LHMP will be regularly monitored, reported upon, evaluated, and updated to remain a current and meaningful planning document.

3 COMMUNITY PROFILE

WHAT'S DIFFERENT ABOUT THE 2026 PLAN?

- The City experienced a slight increase in population, and therefore slight increase in vulnerability since the previous LHMP.
- Projected housing growth within the City results in anticipated increases to vulnerability during the five-year period of this LHMP.
- Integrated additional vulnerability considerations for the whole community, including individuals with access and functional needs.

SECTION 3: COMMUNITY PROFILE

3.1 PHYSICAL SETTING

Fullerton is located in northern Orange County approximately 22 miles southeast of downtown Los Angeles. The community is bordered by the cities of Placentia to the east, Anaheim to the south, Buena Park and La Mirada to the west, and La Habra and Brea to the north. The southern portion of the City lies on flat land; the northern half rises into sloping hills, known as the West Coyote and East Coyote Hills.

3.2 HISTORY

Human settlement in what is now Fullerton dates back to 5,000 BC, or potentially earlier. These early residents were largely nomadic, depending primarily on hunting, fishing, and gathering plants for survival. Eventually the Tongva (Gabrielino) and Acjachemen (Juaneño) Native American cultures developed across much of the area encompassing modern-day Greater Los Angeles, including the area where Fullerton is situated today.

The first documented European in Orange County was Spanish explorer, Gaspar de Portolá, in 1769; the European presence was made more permanent in 1776 with the establishment of Mission San Juan Capistrano to the south. After Mexico (including California) became independent from Spain in 1821, the missions were secularized, and large portions of land were granted to prominent figures. The area of modern-day Fullerton became part of the Rancho San Juan Cajón de Santa Ana grant given to Juan Pacifico Ontiveros in 1837.

After Mexico ceded California to the United States, the state began to connect to the rest of the country via the railroad. Land speculation opportunities in the burgeoning state attracted people from the eastern United States, like George and Edward Amerige. They bought land to the north of the town of Anaheim with the goal of founding a settlement and allocating a portion of the land to the California Central Railroad. In 1887, the Amerige brothers established their settlement, naming it after the President of the Pacific Land and Improvement Co., George H. Fullerton. Agriculture, especially orange growing, became the most prominent industry in Fullerton soon after the City's founding. Oil production became a leading industry in Fullerton in the late nineteenth and early twentieth centuries, driving much of the early growth of the community. In the mid-twentieth century, the City set aside the southern portion of Fullerton nearest the railway as an industrial-only area, leading to the mass consolidation of manufacturing in the area.

3.3 DEMOGRAPHICS AND SOCIOECONOMIC FACTORS

Population, education, employment, and housing data for Fullerton is described in the following sections.

3.3.1 POPULATION

Table 3-1: City of Fullerton and Orange County Population and Housing Data provides an overview of City and county demographics and socioeconomic characteristics.

TABLE 3-1: CITY OF FULLERTON AND ORANGE COUNTY POPULATION AND HOUSING DATA

CATEGORY	CITY OF FULLERTON	ORANGE COUNTY
Total Population	141,278	3,164,063
Percent of residents that are children (under 18 years)	22.6%	21.3%
Percent of Residents that are senior citizens (65 and over)	14.5%	15.8%
Median Age (years)	36.1	39.1
Median Household Income	$104,219	$113,702
Median House Value (Owner-occupied housing units)	859,600	915,500
Occupied Housing Units	47,484	1,074,654
Percent of Renter-Occupied Housing Units	48.5%	43.6%
Percent of Owner-Occupied Housing Units	51.5%	56.4%
Average Household Size	2.91	2.90

Sources: US Census Bureau, 2023: American Community Survey 5-Year Estimates, DP05 Demographic and Housing Estimates, DP04 Selected Housing Characteristics, S1101 Households and Families, S2503 Financial Characteristics.

COMMUNITY PROFILE AT A GLANCE

Access and functional needs are temporary or permanent conditions that require assistance for individuals in emergency situations. The LHMP Stakeholders identified those with access or functional needs

Vulnerable Populations in Fullerton Include:

- *Linguistic Isolation*
- *Persons in group quarters*
- *Elderly Persons*
- *Multi-Unit and Crowded Households*

141,278
City Population

36.1
Median Age

2.91
Average Household Size

The City of Fullerton has an estimated population of 141,278 as reported by the US Census Bureau 2023 American Community Survey (ACS) 5-year estimates. Fullerton residents under the age of 18 account for 22.6 percent of the City's population, while residents 65 and older make up 14.5 percent of the population. The remaining 62.9 percent of the population is between the ages of 18 and 65, with a median age of 36.1 years. Comparatively, the population of Orange County includes 21.3 percent of residents under the age of 18 and 15.8 percent of residents aged 65 and older with a median age of 39.1 years. The age demographics for Fullerton are like those of Orange County; however, the population of Fullerton is slightly younger.

The City has a lower median household income and median house value compared to Orange County. The median household income in Fullerton is $104,219, which is approximately 8.3 percent lower than county median income of $113,702. Similarly, the median home value in Fullerton is approximately 6.1 percent lower than that of Orange County. The City has an average household size of 2.91 persons per household, and the average household size across the county is 2.91 persons per household. The percentages of owner-occupied and renter-occupied housing units between the City and the county are as follows: the percent of renter-occupied housing units is 43.6 percent and owner-occupied housing units is 56.4 percent in the county compared to renter-occupied housing units of 48.5 percent and owner-occupied housing units of 51.5 percent in Fullerton. To summarize, income and housing values are lower on average in Fullerton, there is a larger portion of renters in the City, and the average household size is effectively equal between the City and Orange County. **Table 3-2: City of Fullerton and Orange County Racial and Ethnic Composition** provides an overview of the City and county racial and ethnic demographics below.

The largest ethnic group in Fullerton is the White population, accounting for 43.0 percent of the population. The remaining ethnic makeup consists of Hispanic or Latino at 39.6 percent, Asian at 24.5 percent, Black or African American at 2.1 percent, American Indian and Alaska Native at 0.6 percent, Native Hawaiian and other Pacific Islander at 0.2 percent. Persons identifying as some other race account for 14.6 percent of the population and those identifying as two or more races make up 14.9 percent of the population.

The ethnic makeup of Orange County is also predominantly White, which constitutes 46.4 percent of the population. This is followed by 34.1 percent Hispanic or Latino, 21.9 percent Asian, 1.6 percent Black or African American, 0.8 American Indian and Alaska Native, and 0.3 percent Native Hawaiian and other Pacific Islander. Persons identifying as some other race alone account for 14.1 percent of the population, while those identifying with two or more races making up 14.9 percent of the population.

The populations of Fullerton and Orange County are both diverse to a similar extent with no one race/ethnicity accounting for more than half of the population. Each race/ethnicity account for a similar percentage of the population between the City and county, showing that Fullerton is representative of the population of Orange County. In fact, Fullerton is slightly more racially/ethnically diverse than the county. Mitigation efforts are designed with this high level of diversity in mind which will promote effective mitigation strategies.

TABLE 3-2: CITY OF FULLERTON AND ORANGE COUNTY RACIAL AND ETHNIC COMPOSITION

RACE OR ETHNICITY	CITY OF FULLERTON		ORANGE COUNTY	
	POPULATION	PERCENTAGE	POPULATION	PERCENTAGE
Hispanic or Latino (of any race)*	55,900	39.6%	1,080,480	34.1%
White	60,760	43.0%	1,468,454	46.4%
Black or African American	2,950	2.1%	51,952	1.6%
American Indian and Alaska Native	912	0.6%	23,889	0.8%
Asian	34,644	24.5%	694,189	21.9%
Native Hawaiian and other Pacific Islander	332	0.2%	9,954	0.3%
Some Other Race alone	20,636	14.6%	444,982	14.1%
Two or More Races	21,044	14.9%	470,643	14.9%
Total Population	**141,278**	**100%**	**3,164,063**	**100%**

*Note: The "Hispanic or Latino (of any race)" category encompasses a wide range of racial backgrounds. People who identify with this ethnic category may be of any race, including White, Black, Indigenous, Asian, or other backgrounds of Middle Eastern descent. For this reason, the sum of the race or ethnicity percentages may exceed 100%.

Source: US Census Bureau, 2023: American Community Survey 5-Year Estimates, DP05 Demographic and Housing Estimates.

3.3.2 EDUCATIONAL ATTAINMENT

Educational attainment is analyzed based on the population of individuals aged 25 and older. **Table 3-3: City of Fullerton and Orange County Educational Attainment** identifies the level of educational attainment within the City and county. Of the Fullerton residents aged 25 and over, 16.2 percent attained a graduate or professional degree, 27.4 percent attained a bachelor's degree, and 8.2 percent attained an associate degree. Altogether, about 51.8 percent of the City's population has completed a higher education degree indicating a high level of educational attainment.

In comparison, educational attainment in Orange County includes 16.1 percent of the population who attained a graduate or professional degree, 27.3 percent attained a bachelor's degree, and 7.7 percent attained an associate degree. A total of approximately 51.1 percent of the Orange County population attained a higher education degree.

The level of educational attainment in the City of Fullerton is very similar to the rest of Orange County, indicating that Fullerton is representative of the county in terms of higher education outcomes. The high level of educational attainment within the City may correlate with higher income and economic stability which may improve resilience to hazards at the individual or household level.

TABLE 3-3: CITY OF FULLERTON AND ORANGE COUNTY EDUCATIONAL ATTAINMENT

EDUCATIONAL ATTAINMENT (AGE 25 AND OVER)	CITY OF FULLERTON		ORANGE COUNTY	
	POPULATION	PERCENTAGE	POPULATION	PERCENTAGE
Less than 9th Grade	6,130	6.4%	160,449	7.3%
9th to 12th Grade, no diploma	5,020	5.3%	127,451	5.8%
High School Graduate	14,964	15.7%	379,386	17.2%
Some College, No Degree	19,652	20.7%	411,837	18.7%
Associate degree	7,826	8.2%	168,956	7.7%
Bachelor's Degree	26,087	27.4%	601,466	27.3%
Graduate or Professional Degree	15,391	16.2%	355,582	16.1%
Total	**95,070**	**100%**	**2,205,127**	**100%**

Source: US Census Bureau, 2023: American Community Survey 5-Year Estimates, S1501 Educational Attainment.

3.3.3 ECONOMIC AND EMPLOYMENT TRENDS

Economic and employment trends are based on the population of individuals aged 16 and over. Additionally, the labor force consists of individuals aged 16 and over who are either employed or unemployed and actively seeking work. **Table 3-4: City of Fullerton Employment and Income** provides an overview of economic and employment trends for the City.

Fullerton has 112,664 residents aged 16 years and older and 73,779 individuals within the labor force.[1] Of the individuals in the labor force, 68,935 (93.4 percent) are employed and 4,802 (6.5 percent) are unemployed. The majority of employed residents in Fullerton are employed in the following industries: educational services, health care, and social assistance (23.7 percent); professional, scientific, and management, and administrative and waste management services (13.4 percent); manufacturing (12.6 percent); retail trade (10.3 percent); and arts, entertainment, and recreation, and accommodation and food services (9.8 percent). The remainder of employed residents are employed in the construction (7.1 percent); finance, insurance, and real estate (6.6 percent); other services (4.4 percent); transportation, warehousing, and utilities (4.0 percent); public administration (3.8 percent); wholesale trade (2.8 percent); information (1.0 percent); and agriculture, forestry, fishing, hunting and mining (0.5 percent) industries.

The median household income for Fullerton is $104,219 per year. Most workers commute to work alone via car, truck or van (70.6 percent) or carpool via car, truck or van (10.3 percent). Less common modes of transportation to work include public transportation (2.2 percent), walking (2.3 percent) or other means (1.8 percent). The average travel time for workers in Fullerton is 30 minutes. An estimated 12.6 percent of the working population work from

[1] US Census Bureau, American Community Survey 5-Year Estimates Data Profiles, *Table DP03 Selected Economic Characteristics*, 2023, https://data.census.gov/table/ACSDP5Y2023.DP03?q=DP03:+Selected+Economic+Characteristics&g=050XX00US06059_160XX00US0628000, accessed August 26, 2025.

home. US Census inflow and outflow analysis for 2022 shows a net inflow of workers into the City Fullerton. An estimated 61,507 people work in Fullerton but live outside of the City, which constitutes an inflow during the workday. Additionally, an estimated 59,372 people live in Fullerton but work outside of the City, which constitutes an outflow during the workday. This indicates a net inflow of 2,135 individuals into the City on workdays.

TABLE 3-4: CITY OF FULLERTON EMPLOYMENT AND INCOME

CATEGORY	POPULATION	PERCENTAGE
Aged 16 years and older	112,664	—
Labor Force	73,779	100%
Employed	68,935	93.4%
Unemployed	4,802	6.5%
Median Household Income	$104,219	—
Employment by Industry		
Educational services, and health care and social assistance	16,342	23.7%
Professional, scientific, and management, and administrative and waste management services	9,237	13.4%
Manufacturing	8,700	12.6%
Retail trade	7,094	10.3%
Arts, entertainment, and recreation, and accommodation and food services	6,775	9.8%

Source: US Census Bureau, 2023: American Community Survey 5-Year Estimates, DP03 Selected Economic Characteristics.

3.3.4 HOUSING

According to the 2023 ACS 5-year estimates, there are 49,707 housing units in Fullerton. Occupied housing units (47,484 units) account for 95.5 percent and there is a vacancy rate of 4.5 percent of housing units. Of the occupied housing units, 51.5 percent are owner-occupied, and 48.5 percent are renter-occupied. The median home value is $859,600 for owner-occupied units in the City and most housing units in Fullerton were built from 1950 to 1979 (63.7 percent).[2] Housing occupancy, value, and age of the building are important factors in determining potential vulnerability and potential loss associated with certain hazards.

There are 47,484 total households within Fullerton and the average household size is 2.91 persons per household. The most common household sizes are the 2-person household and the 4-or-more-person household which account for 29.8 percent and 29.7 percent respectively. Approximately 21.4 percent of households are 1-person households and 19.2 percent are 3-person households. Average household size is used to determine the population of residents that may be impacted by certain hazards.

[2] US Census Bureau, American Community Survey 5-Year Estimates Data Profiles, *Table DP04 Selected Housing Characteristics*, 2023, https://data.census.gov/table/ACSDP5Y2023.DP04?q=dp04&g=050XX00US06059_160XX00US0628000, accessed August 26, 2025.

Single-family housing units make up the majority of the housing units in Fullerton, accounting for 75.8 percent of units. Multi-unit housing accounts for 22.1 percent and mobile homes and all other housing types account for only 2.1 percent of houses in Fullerton. Household types are divided into family households (70.2 percent) and nonfamily households (29.8 percent). Family households are predominantly made up of married-couple families (75.3 percent) but also include other family households where no spouse is present. Nonfamily households consist of householders that may or may not live alone.

3.4 LAND USES AND EXISTING DEVELOPMENT

The Fullerton Plan, which serves as the General Plan for the City, regulates land uses in the City. **Table 3-5: Fullerton Community Development Types** describes the community development types and land uses that exist throughout the City and **Table 3-6: Community Development Type Intensity/Density Standards** identifies the residential density and non-residential intensity standards for each community development type.

TABLE 3-5: FULLERTON COMMUNITY DEVELOPMENT TYPES

COMMUNITY DEVELOPMENT TYPE	DESCRIPTION	ALLOWABLE LAND USES
Residential		
Low Density Residential	Low density and suburban living	Detached dwellings; Accessory second units; Limited neighborhood-serving commercial; Compatible public, quasi-public, and special uses.
Low/Medium Density Residential	Suburban living with a range of housing options	Small-lot detached dwellings; Detached dwellings; Attached dwellings; Accessory second units; Limited neighborhood-serving commercial; Compatible public, quasi-public, and special uses.
Medium Density Residential	Urban living within a compact and walkable neighborhood	Small-lot detached dwellings; Attached dwellings; Live-work units; Limited neighborhood-serving commercial; Compatible public, quasi-public, and special uses
High Density Residential	Dense urban living within a compact, walkable neighborhood that is well served by transit	Attached dwellings; Live-work units; Limited neighborhood-serving commercial; Compatible public, quasi-public, and special uses
Greenbelt Concept	Natural topography while creating a living environment which best serves the needs of its residents.	Detached dwellings; Attached dwellings Limited neighborhood-serving commercial; Compatible public, quasi-public, and special uses
Commercial		
Commercial	Opportunities for convenient commerce	Retail, service, and/or office; Gathering places such as plazas or parks;

COMMUNITY DEVELOPMENT TYPE	DESCRIPTION	ALLOWABLE LAND USES
	within both neighborhood and regional shopping centers.	Compatible public, quasi-public, and special uses
Office	Professional office businesses and supporting uses and amenities.	Business and professional; Office flex-space; Retail and service uses that provide support to employees; Gathering places such as plazas, courtyards, or parks; Compatible public, quasi-public, and special uses
Mixed Use		
Downtown Mixed-Use	A mix of commercial, civic, and mixed-use buildings that promote pedestrian activity and are compatible with the Downtown's historic character.	Office, retail and service uses; Attached dwellings; Gathering places such as plazas, courtyards, or parks; Compatible public, quasi-public and special uses
Neighborhood Center Mixed-Use	Neighborhood centers that provide nearby residents with opportunities to walk to retail and service businesses, office uses, and civic gathering spaces.	Retail, service, office, and/or residential uses; Gathering places such as plazas, courtyards, or parks; Compatible public, quasi-public, and special uses
Urban Center Mixed-Use	Urban centers that serve the local and regional populations by offering major commercial, office, and mixed-use developments	Retail, service, office, and/or residential uses; Gathering places such as plazas, courtyards, or parks; Compatible public, quasi-public, and special uses
Industrial		
Industrial	Manufacturing, product assembly, research and development, warehousing, and supporting uses and amenities	Industrial or manufacturing; Office, retail and service uses that provide support to employees; Compatible public, quasi-public and special uses. This designation should not be located adjacent to a residential neighborhood or center without substantial buffers
Public Land		
School Facilities	Sites for local school districts to develop and maintain educational institutions for local and	Elementary school; Middle/junior high school; High school; Community college; College/university; Continuation schools

COMMUNITY DEVELOPMENT TYPE	DESCRIPTION	ALLOWABLE LAND USES
	surrounding communities	
Government Facilities	Government facilities that are necessary or desired for public health, safety, and welfare.	Government buildings; Airports; Transportation and utility facilities; Compatible public and quasi-public uses
Parks and Recreation	Sites for informal and formal recreation and play and to encourage physical activity and exercise.	Parks (community and regional/passive and active); Greenways and trails; Golf courses and commercial recreation facilities with an emphasis on outdoor; Habitat; Agriculture; Floodplains; Areas with permanent open space easements; Buffers between urban areas; Compatible public, quasi-public, and selected special uses
Other		
Religious Institutions	Opportunities for religious gatherings, worship, and related educational and community service activities.	Religious assembly; Religious worship; Religious education; Compatible public, quasi-public, and selected special uses
Specific Plan	Developments with a unique character that would not be achieved under the City's existing Community Development Types	Mix of uses as specified by the Specific Plan

Source: The Fullerton Plan, Part II: The Fullerton Plan Elements, E: Tables and Exhibits.

TABLE 3-6: COMMUNITY DEVELOPMENT TYPE INTENSITY/DENSITY STANDARDS

DESIGNATION	RESIDENTIAL DENSITY	NON-RESIDENTIAL INTENSITY
Residential		
Low Density Residential	Up to 6 du/ac	Up to 0.35 FAR
Low/Medium Density Residential	6.1 to 15 du/ac	Up to 0.35 FAR
Medium Density Residential	15.1 to 28 du/ac	Up to 0.50 FAR
High Density Residential	Over 28 du/ac	Up to 0.65 FAR
Greenbelt Concept	Up to 3 du/ac	N/A
Commercial		
Commercial	N/A	0.30 to 0.35 FAR
Office	N/A	0.30 to 0.35 FAR
Mixed Use		
Downtown Mixed-Use	30 to 60 du/ac	0.9 to 2.0 FAR

DESIGNATION	RESIDENTIAL DENSITY	NON-RESIDENTIAL INTENSITY
Neighborhood Center Mixed-Use	16 to 60 du/ac	0.5 to 3.0 FAR
Urban Center Mixed-Use	30 to 80 du/ac	0.75 to 3.0 FAR
Industrial		
Industrial	N/A	0.35 to 0.50 FAR
Public Land		
School Facilities	N/A	N/A
Government Facilities	N/A	N/A
Parks and Recreation	N/A	N/A
Other		
Religious Institutions	N/A	Up to 0.35 FAR
Specific Plan	Based on Specific Plan	

Source: The Fullerton Plan, Part II: The Fullerton Plan Elements, E: Tables and Exhibits.

Most of the land is designated for residential use, primarily low density residential. Other major uses designated throughout the City include greenbelt concept and parks and recreation, which contain large areas of active and passive open space. Greenbelt concept and parks and recreation land uses are generally located throughout the northern portions of the City. Additionally, there are various industrial uses throughout the City which are generally concentrated in certain areas. Concentrated industrial uses are located in: the southeast, south of the Metrolink 91-Perris Valley Line and east of the Metrolink Orange County Line; the west, between Malvern Avenue and Commonwealth Avenue; and the north, north of Imperial Highway. Commercial land uses are located throughout the City and generally concentrated along Orangethorpe Avenue and Commonwealth Avenue. Other uses of significance include School, Government, and Religious Institution.

3.5 DEVELOPMENT TRENDS AND FUTURE DEVELOPMENT

3.5.1 CHANGES IN LAND USE, POPULATION PATTERNS AND DEVELOPMENT TRENDS FROM PREVIOUS FIVE YEARS

Since the previous iteration of the 2020 LHMP, population patterns have remained the same, while development and land use in the planning area has not substantially changed. The City population increased nominally, from approximately 141,061 individuals in 2020 to 141,278 – representing a gain less than one percent increase of the City population.[3] The City of Fullerton Housing Element identified population growth trends from 2000 to 2020 and noted that the annual growth rate over that period was about 0.6 percent. This indicates a minimal increase in risk and vulnerability since the previous LHMP due to increased population within Fullerton.

As noted, the Fullerton Plan serves as the General Plan and regulates land uses in the City. Development since the previous iteration of the LHMP primarily included residential or mixed-

[3] US Census Bureau, American Community Survey 5-Year Estimates Data Profiles, *Table DP05 Demographic and Housing Characteristics*, 2020, https://data.census.gov/table?q=DP05&g=160XX00US0628000, accessed August 27, 2025.

use infill development, usually on low-density commercial centers or parking lots, or rehabilitation of existing structures. During the previous housing cycle, the City made progress towards housing objectives. Progress in achieving quantified housing objectives from 2013 through 2020 included new construction of 1,653 units and rehabilitation of 96 units. Housing programs from the previous housing cycle were generally effective at addressing housing needs for special needs groups; however, despite this progress, not all housing goals for new construction and rehabilitation of housing units was met. The total number of housing units in Fullerton, as reported by the 2020 ACS 5-year estimates, was 47,722 units.[4] Currently, the ACS 5-year estimates the total number of housing units in Fullerton at 49,707 units – indicating about a 4.2 percent increase in the number of housing units since 2020.

3.5.2 CHANGES IN LAND USE, POPULATION PATTERNS AND DEVELOPMENT TRENDS FOR FUTURE FIVE YEARS

This LHMP assumes future population growth in Fullerton over the next five years from changes in land use and development trends, and therefore overall vulnerability is assumed to increase accordingly. A key indicator of projected growth is the California Department of Housing and Community Development (HCD) Regional Housing Need Allocation (RHNA). The RHNA represents the minimum number of housing units the City is required to provide adequate sites via zoning regulations. For the 2021-2029 Housing Element cycle, the City of Fullerton is required to accommodate 13,209 residential units by 2029.[5] A breakdown of the required housing units by income group, as presented in the Fullerton Housing Element (2025), is included in **Table 3-7: City of Fullerton 2021-2029 RHNA Allocation**, below.

TABLE 3-7: CITY OF FULLERTON 2021-2029 RHNA ALLOCATION

INCOME GROUP	TOTAL HOUSING UNITS ALLOCATED	PERCENTAGE OF UNITS
Extremely/Very Low*	3,198	24.2%
Low	1,989	15.1%
Moderate	2,271	17.2%
Above Moderate	5,751	43.5%
Total	**13,209**	**100%**

*Note: The City has a RHNA allocation of 3,198 very low-income units (inclusive of extremely low-income units. Pursuant to State law (AB 2634), the City must project the number of extremely low-income housing needs based on Census income distribution or assume 50 percent of the very low income units as extremely low. Assuming an even split, the City's RHNA allocation of 3,198 very low-income units may be divided into 1,599 very low and 1,599 extremely low income units. However, for purposes of identifying adequate sites for the RHNA allocation, State law does not mandate separate accounting for the extremely low income category.

Source: Southern California Association of Governments, SCAG 6th Cycle Final RHNA Allocation Plan, https://scag.ca.gov/sites/default/files/2024-05/6th_cycle_final_rhna_allocation_plan_070121.pdf, accessed August 25, 2025.

[4] US Census Bureau, American Community Survey 5-Year Estimates Data Profiles, *Table DP05 Demographic and Housing Characteristics*, 2020, https://data.census.gov/table?q=DP05&g=160XX00US0628000, accessed August 27, 2025.

[5] Southern California Association of Governments, *SCAG 6th Cycle Final RHNA Allocation Plan*, https://scag.ca.gov/sites/default/files/2024-05/6th_cycle_final_rhna_allocation_plan_070121.pdf, accessed August 25, 2025.

The Fullerton 2021-2029 Housing Element identifies various resources for housing developments to meet the RHNA allocation of 13,209 units. The City's Housing Element acknowledges that its current land inventory is insufficient to meet RHNA targets under existing zoning, particularly for very-low and low-income housing. The City's strategy for accommodating new housing relies on infill development, adaptive reuse, and zoning flexibility. A central tool in this strategy is the Housing Incentive Overlay Zone (HIOZ), which enables residential development on parcels currently zoned for commercial or industrial use. The HIOZ provides optional incentives for housing projects, and a requirement that 20% of units be affordable to moderate-income households or below. A total of 759 parcels are included in the overlay zone, with concentrations along Commonwealth Avenue, South Harbor Boulevard, East Valencia Drive, and other parcels throughout the city. These areas are likely to see increased residential density and redevelopment activity, which may influence future exposure to natural and human-caused hazards. Existing uses that could be redeveloped included existing commercial, retail, office, and industrial uses. These sites are generally concentrated around Commonwealth Avenue, Walnut Avenue, Valencia Drive and others.

The Fullerton Community and Economic Development Department also oversees various development projects to be completed in the next five years. **Table 3-8: Community Development Projects** identifies ongoing and upcoming development projects in the community that may lead to increased capacity for growth and population increase within the City.

TABLE 3-8: COMMUNITY DEVELOPMENT PROJECTS

PROJECT TYPE	PROJECT DESCRIPTION	CURRENT STATUS
Residential	**Request for Builders Remedy:** Multi-Family Residential project, 28 Units with 20% of Units Deed-Restricted Affordable.	Development Review Committee
Residential	**Pointe Common:** 62 Unit Multi-Family Residential Units, All Units Slated to Be Affordable.	Construction
Residential	**245 N State College Blvd:** Request to Construct 25 Residential Town Homes with Subterranean Parking.	Approved by City Council
Residential	**The Pines at Sunrise Village:** 49 Detached Single-Family Residences, 64 Townhomes, 19,000 SF of New Retail	Currently Under Construction.
Residential	**East Amerige Avenue Project:** Request to construct 8 multi-family residential units.	Development Review Committee
Residential	**Highland Tract Map:** Tentative Tract Map for 13 parcels and one letter lot (for private street) and a Major Site Plan Review for 13 single-family residences.	Plan Check
Residential	**Hub Fullerton:** Student oriented housing - 420 units Additional Retail on 1st Floor.	Construction
Residential	**West Coyote Hills:** Major Residential Development.	Final Tract Map Approved.
Mixed-Use	**Atlas Fullerton:** Multi-Family Residential - 329 units	Plan Check

PROJECT TYPE	PROJECT DESCRIPTION	CURRENT STATUS
Mixed Use	**Parkwest Project:** Proposed 124 room hotel, 140 residential units and minor commercial.	Approved by Planning Commission
Mixed- Use	**Brookhurst/Orangethorpe Project:** Mixed-use project consisting of 4 parcels with existing uses. The Gas station will remain. Structures on the remainder of the parcels will be demolished and a new building consisting of commercial retail/office (6808 S.F.) on the street level. 63 residential units above the garage level.	Plan Check
Mixed-Use	**Casa Bella - Highland & Valencia:** 20 residential apartment units of with 1,152 sq. ft. commercial space.	Construction
Industrial	**Rexford Industrial Fullerton:** Demolition of hotel and construction of industrial building (6,000 sq. ft.) and office pod (6,000 sq. ft.)	Construction
Industrial	**Rexford Via Burton Fullerton:** Major Site Plan to demolish an existing industrial building and develop the site with a new 139,449-square-foot industrial warehouse building.	Construction
Industrial	**Acacia and Kimberly Industrial Project:** Request for a Major Site Plan to construct a 186,632-square-foot tilt-up speculative warehouse on property zoned M-P-80ES	Plan Check Review
Industrial	**Goodman Logistics:** approximately 1.5 million sq. ft. Logistics Center.	Construction
Commercial	**The Fox Block:** Proposed Public Parking Structure and Commercial development adjacent to Historic Fox Theatre on RDA surplus land.	Plan Check Review
Commercial	**Shoe City Billboard:** Request to construct and operate an electronic billboard facing the 91 Freeway.	Construction
Commercial	**Truck Yard Project:** Major Site Plan Review application proposed demolition of existing buildings and development of truck trailer and automobile parking	On Hold
Commercial	**76 Gas Station:** Request for a CUP and MSP to construct a new service station.	Planning Commission Approved
Commercial	**Fullerton Crossings:** Request for a CUP modification to add an additional drive-through restaurant to the existing master plan.	Zoning Administrator Hearing
Commercial	**Raymond St. Project:** Request for a Minor Site Plan, for an industrial development on property zoned M-G, Manufacturing General.	Director Approval
Commercial	**Freeway Oriented Billboard – Nutwood:** Request for a Conditional Use Permit for a freeway - oriented billboard	Design Review Committee

Source: City of Fullerton, Current Development Projects, https://www.cityoffullerton.com/government/departments/community-and-economic-development/planning-zoning/development-activity, accessed August 28, 2025.

Over the next five years, the City of Fullerton is taking on diverse development projects, including residential, mixed-use, industrial, commercial, and student-oriented housing. Notably, there is a strong emphasis on multi-family residential developments, many of which include affordable housing components. Mixed-use projects combine housing with commercial space, often replacing older structures or underutilized lots. Industrial expansion is also significant, with large-scale logistics centers and warehouse developments transforming former hotel and industrial sites. Commercial projects include new service stations, billboards, and retail expansions, while student housing near educational institutions is rapidly growing. These developments are dispersed throughout the city, often in areas transitioning from older commercial or industrial uses. The scale and density of these projects may increase vulnerability to hazards.

In addition to the current development projects listed above. The City of Fullerton Public Works Department is advancing several capital improvement projects that align with broader land use and development goals, particularly those relevant to hazard mitigation and sustainable growth. Key initiatives include substantial investments in sewer and water system upgrades, street rehabilitation, and park improvements, all of which enhance the City's infrastructure resilience and support future development capacity.

3.6 INFRASTRUCTURE SYSTEMS

3.6.1 TRANSPORTATION

A system of major and primary arterial highways provides vehicular circulation throughout the city. The east-west highways providing access to/from and through the city are Imperial Highway (State Route 90), Bastanchury Road, Malvern/Chapman Avenue, Commonwealth Avenue, and Orangethorpe Avenue. Similarly, Beach Boulevard (State Route 39), Euclid Street, Harbor/Brea Boulevard, State College Boulevard, and Placentia Avenue provide the north-south highways. The Orange Freeway (State Route 57) runs along Fullerton's eastern border and the Riverside Freeway (State Route 91) runs along the southern border of Fullerton, and the Santa Ana Freeway (Interstate 5) runs nearby the southwest city limits. The Orange County Transportation Authority runs bus lines that connect Fullerton with cities in Los Angeles and Orange Counties. Fullerton's rail station in the downtown area is served by Metrolink commuter trains, Amtrak's Pacific Surfliner route, and the long-distance Southwest Chief Amtrak train. Freight rail service is provided by BNSF Railroad and Union Pacific Railroad. The nearest airports with commercial service are John Wayne International Airport and Long Beach Airport. Fullerton Municipal Airport serves general aviation aircraft.

3.6.2 WATER AND WASTEWATER

The City of Fullerton operates a comprehensive water system established in 1906, serving over 141,000 residents across a 22.3-square-mile area. Its water supply is sourced primarily from groundwater (77%) via the Orange County Basin, supplemented by imported water (23%) from the Metropolitan Water District, including the Colorado River and State Water Project. The system includes 424 miles of distribution pipes, 15 reservoirs, 12 booster stations, and 10 wells. Fullerton's wastewater system maintains over 320 miles of sewer pipelines and includes programs for routine cleaning, emergency response, and Fats, Oils, and Grease (F.O.G.) control

to prevent blockages. Both systems are managed by the City's Public Works Department, which oversees infrastructure maintenance and long-term planning to ensure reliability and sustainability.

3.6.3 SANITATION AND SOLID WASTE

The City of Fullerton provides sanitation and solid waste services through an exclusive franchise agreement with Republic Services, a national waste management company. Republic Services handles all aspects of trash, recycling, and organic waste collection for residential and commercial customers within the city.

3.6.4 ELECTRICITY

Fullerton receives its electricity from Southern California Edison, which is one of California's four major investor-owned utility companies and the largest electrical supplier in the state. Southern California Edison sources electricity from power plants throughout California and neighboring states and delivers it through a network of large-scale power lines and substations.

3.6.5 NATURAL GAS

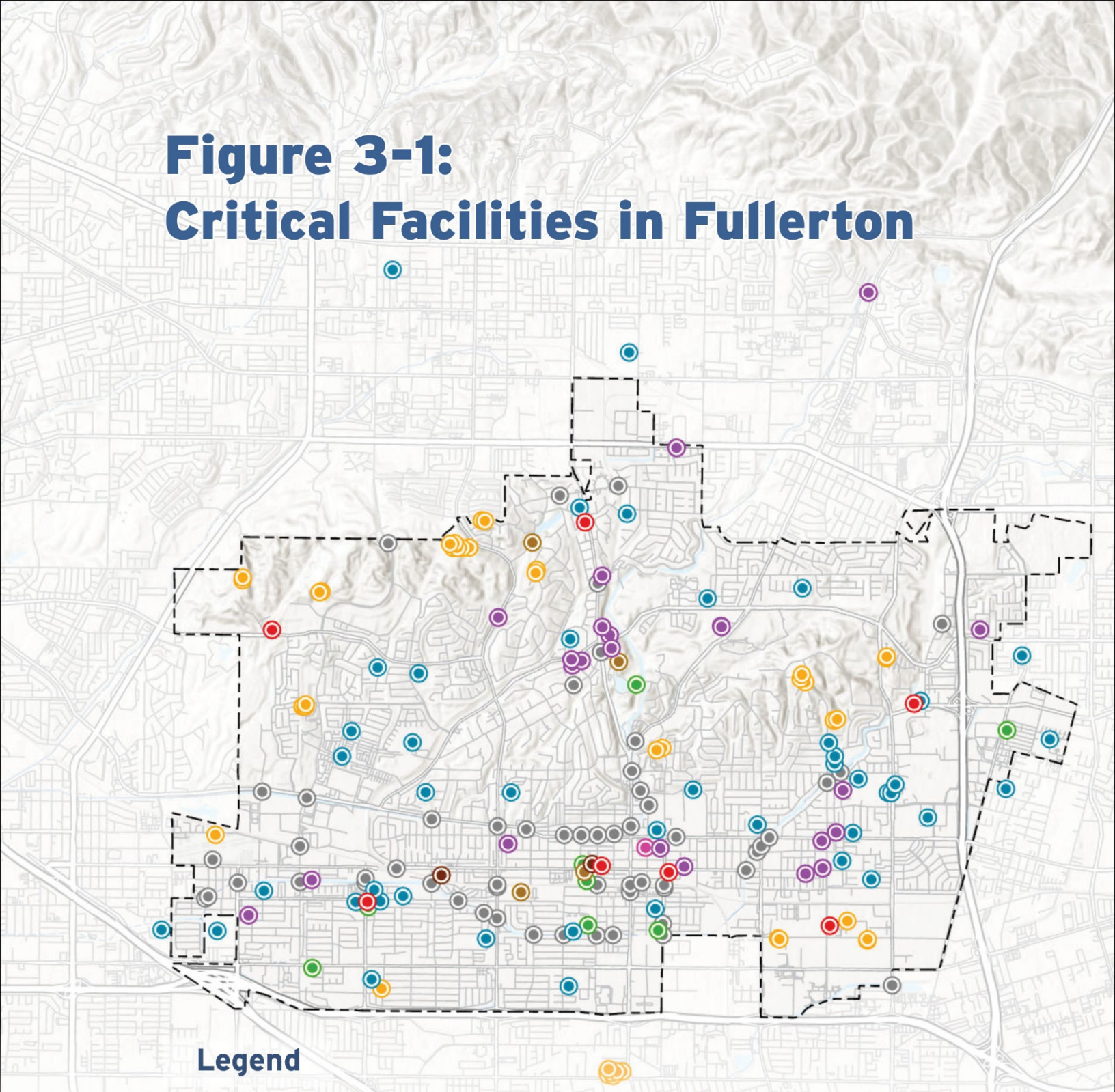
Natural gas services in Fullerton is provided by the Southern California Gas Company. There is one major transmission line running along S Placentia Avenue as well as a high-pressure distribution line with branches running along Brookhurst Street, W Valencia Drive, S Placentia Avenue, and Nutwood Avenue. No other large pipelines are present. Various facilities in neighboring communities help to keep the natural gas flowing safely and reliably. Damage to transmission lines in Fullerton or to facilities in surrounding communities could impact services in Fullerton. Because natural gas is highly flammable and potentially combustible, any rupture in a natural gas pipeline or an accident that causes a spark around natural gas could lead to a fire or explosion.

3.7 CRITICAL FACILITIES

The LHMP Planning Team identified 167 critical facilities and 69 facilities of concern in Fullerton for incorporation into the vulnerability assessment and associated hazard analysis. For the purposes of this plan, critical facilities meet the FEMA definition of those facilities essentials for the delivery of vital services or protection of a community, especially during and after a disaster. Critical facilities listed tend to be owned and operated by the City of Fullerton, though there are some assets owned by other stakeholders.

Facilities of concern include those facilities that may not reach the formal definition of critical facilities, but are nonetheless significant for purposes of emergency response. Facilities of concern listed in this plan tend to include assets that are not owned or operated by the City. Critical facilities and facilities of concern are identified in **Figure 3-1: Critical Facilities in Fullerton**, **Table 3-9** and **Table 3-10** below. Specific addresses and location data for some critical facilities are withheld for safety and security purposes.

Figure 3-1:
Critical Facilities in Fullerton



Legend

- City of Fullerton Municipal Boundary
- Safety and Security
- Medical
- Emergency Gathering Areas
- Community Services
- Municipal Services
- Education
- Transportation
- Utility
- Museum

0 1 mile 2 miles

N

Source: City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

TABLE 3-9: CITY OF FULLERTON CRITICAL FACILITIES

ID	NAME	CRITICAL FACILITY TYPE	COMMUNITY LIFELINE
1	City Hall	Municipal Government	Safety and Security
2	City Yard	Municipal Government	Safety and Security
3	Fire Station 1	Fire Station	Safety and Security
4	Fire Station 2	Fire Station	Safety and Security
5	Fire Station 3	Fire Station	Safety and Security
6	Fire Station 4	Fire Station	Safety and Security
7	Fire Station 5	Fire Station	Safety and Security
8	Fire Station 6	Fire Station	Safety and Security
9	Police Station	Police Station	Safety and Security
10	Garnet Community Center	Community Center	Safety and Security
11	Maple Community Center	Community Center	Safety and Security
12	Richman Community Center	Community Center	Safety and Security
13	Main Library	Library	Safety and Security
14	Gilbert Community Center	Community Center	Safety and Security
15	Amerige Park	Park	Safety and Security
16	Brea Dam Park	Park	Safety and Security
17	Fullerton Museum Center	Museum	Safety and Security
18	St Jude Medical Center	Hospital	Health and Medical
19	Fullerton Community Center	Community Center	Safety and Security
20	Fullerton Tennis Center	Sports Center	Safety and Security
21	Independence Park	Park	Safety and Security
22	Laguna Lake Park	Park	Safety and Security
23	Fullerton Airport	Airport	Transportation
24	Transportation Center	Transportation Center	Transportation
25	Bridge 55C0147	Bridge	Transportation
26	Bridge 55C0290	Bridge	Transportation
27	Bridge 55C0292	Bridge	Transportation
28	Bridge 55C0288	Bridge	Transportation
29	Bridge 55C0293	Bridge	Transportation
30	Bridge 55C0291	Bridge	Transportation
31	Bridge 55C0224	Bridge	Transportation
32	Bridge 55C0228	Bridge	Transportation
33	Bridge 55C0226	Bridge	Transportation
34	Bridge 55C0225	Bridge	Transportation
35	Bridge 55C0227	Bridge	Transportation
36	Bridge 55C0229	Bridge	Transportation
37	Bridge 55C0386	Bridge	Transportation
38	Bridge 55C0230	Bridge	Transportation
39	Bridge 55C0120	Bridge	Transportation
40	Bridge 55C0346	Bridge	Transportation
41	Bridge 55C0289	Bridge	Transportation

ID	NAME	CRITICAL FACILITY TYPE	COMMUNITY LIFELINE
42	Bridge 55C0602	Bridge	Transportation
43	Bridge 55C0638	Bridge	Transportation
44	Bridge 55C0584	Bridge	Transportation
45	Bridge 55C0233	Bridge	Transportation
46	Bridge 55C0231	Bridge	Transportation
47	Bridge 55C0235	Bridge	Transportation
48	Bridge 55C0294	Bridge	Transportation
49	Bridge 55C0243	Bridge	Transportation
50	Bridge 55C0242	Bridge	Transportation
51	Bridge 55C0244	Bridge	Transportation
52	Bridge 55C0234	Bridge	Transportation
53	Bridge 55C0418	Bridge	Transportation
54	Bridge 55C0703	Bridge	Transportation
55	Bridge 55C0297	Bridge	Transportation
56	Bridge 55C0298	Bridge	Transportation
57	Bridge 55C0296	Bridge	Transportation
58	Bridge 55C0387	Bridge	Transportation
59	Bridge 55C0345	Bridge	Transportation
60	Bridge 55C0586	Bridge	Transportation
61	Bridge 55C0384	Bridge	Transportation
62	Bridge 55C0308	Bridge	Transportation
63	Bridge 55C0236	Bridge	Transportation
64	Bridge 55C0526	Bridge	Transportation
65	Bridge 55C0232	Bridge	Transportation
66	Bridge 55C0263	Bridge	Transportation
67	Bridge 55C0585	Bridge	Transportation
68	Bridge 55C0310	Bridge	Transportation
69	Bridge 55C0311	Bridge	Transportation
70	Bridge 55C0312	Bridge	Transportation
71	Bridge 55C0664	Bridge	Transportation
72	Bridge 55C0383	Bridge	Transportation
73	Bridge 55C0385	Bridge	Transportation
74	Bridge 55C0309	Bridge	Transportation
75	Bridge 55C0307	Bridge	Transportation
76	Bridge 55C0295	Bridge	Transportation
77	Bridge 55C0525	Bridge	Transportation
78	Bridge 55C0685	Bridge	Transportation
79	Bridge 55C0681	Bridge	Transportation
80	Coyote Pump Station (1)	Pump Station	Water Systems
81	Coyote Pump Station (2)	Pump Station	Water Systems
82	Coyote Pump Station (3)	Pump Station	Water Systems
83	Coyote Reservoir	Reservoir	Water Systems
84	Hawks Point Pump Station (1)	Pump Station	Water Systems
85	Hawks Point Pump Station (2)	Pump Station	Water Systems
86	Hawks Pointe Reservoir	Reservoir	Water Systems
87	Hermitage Pump Station (1)	Pump Station	Water Systems

ID	NAME	CRITICAL FACILITY TYPE	COMMUNITY LIFELINE
88	Hermitage Pump Station (2)	Pump Station	Water Systems
89	Hermitage Pump Station (3)	Pump Station	Water Systems
90	Hermitage Pump Station (4)	Pump Station	Water Systems
91	Hermitage Pump Station (5)	Pump Station	Water Systems
92	Hermitage Reservoir	Reservoir	Water Systems
93	Hillcrest Pump Station (1)	Pump Station	Water Systems
94	Hillcrest Pump Station (2)	Pump Station	Water Systems
95	Hillcrest Reservoir	Reservoir	Water Systems
96	Kimberly2 Pump Station (1)	Pump Station	Water Systems
97	Kimberly2 Pump Station (2)	Pump Station	Water Systems
98	Kimberly2 Pump Station (3)	Pump Station	Water Systems
99	Laguna Pump Station (2)	Pump Station	Water Systems
100	Laguna Pump Station(1)	Pump Station	Water Systems
101	Laguna Reservoir	Reservoir	Water Systems
102	Las Palmas Pump Station (1)	Pump Station	Water Systems
103	Las Palmas Pump Station (2)	Pump Station	Water Systems
104	Las Palmas Reservoir	Reservoir	Water Systems
105	Lower Acacia Pump Station (1)	Pump Station	Water Systems
106	Lower Acacia Pump Station (2)	Pump Station	Water Systems
107	Lower Acacia Pump Station (3)	Pump Station	Water Systems
108	Lower Acacia Pump Station (4)	Pump Station	Water Systems
109	Lower Acacia Pump Station (5)	Pump Station	Water Systems
110	Lower Acacia Pump Station (6)	Pump Station	Water Systems
111	Lower Acacia Reservoir	Reservoir	Water Systems
112	Main Plant Pump Station (1)	Pump Station	Water Systems
113	Main Plant Pump Station (2)	Pump Station	Water Systems
114	Main Plant Pump Station (3)	Pump Station	Water Systems
115	Main Plant Pump Station (4)	Pump Station	Water Systems
116	Main Plant Pump Station (5)	Pump Station	Water Systems
117	Main Plant Reservoir	Reservoir	Water Systems
118	State College Pump Station (1)	Pump Station	Water Systems
119	State College Pump Station (2)	Pump Station	Water Systems
120	State College Reservoir	Reservoir	Water Systems
121	Tank Farm Pump Station (1)	Pump Station	Water Systems
122	Tank Farm Pump Station (2)	Pump Station	Water Systems
123	Tank Farm-T1 Reservoir	Reservoir	Water Systems
124	Tank Farm-T2 Reservoir	Reservoir	Water Systems
125	Tank Farm-T3 Reservoir	Reservoir	Water Systems
126	Tank Farm-T4 Reservoir	Reservoir	Water Systems
127	Tank Farm-T5 Reservoir	Reservoir	Water Systems
128	Upper Acacia Pump Station (1)	Pump Station	Water Systems
129	Upper Acacia Pump Station (2)	Pump Station	Water Systems
130	Upper Acacia Pump Station (3)	Pump Station	Water Systems
131	Upper Acacia Pump Station (4)	Pump Station	Water Systems
132	Upper Acacia-T1 Reservoir	Reservoir	Water Systems
133	Upper Acacia-T2 Reservoir	Reservoir	Water Systems

ID	NAME	CRITICAL FACILITY TYPE	COMMUNITY LIFELINE
134	Kimberly Well 1A PFAS Water Treatment Plant	Water Treatment Plant	Water Systems
135	Main Plant Treatment	Water Treatment Plant	Water Systems
136	Southern California Edison	Utility – Location Withheld	Energy
137	Southern California Edison	Utility – Location Withheld	Energy
138	Carbon Canyon Dam	Dam – Location Withheld	Water Systems, Safety and Security
139	Prado Dam	Dam – Location Withheld	Water Systems, Safety and Security
140	Caltrans Undercrossing 55 0466	Bridge – Location Withheld	Transportation
141	Caltrans Undercrossing 55 0465	Bridge – Location Withheld	Transportation
142	Caltrans Undercrossing 55 0456	Bridge – Location Withheld	Transportation
143	Caltrans Overhead Separation 55 0502r	Bridge – Location Withheld	Transportation
144	Caltrans Connection Overhead 55 0503g	Bridge – Location Withheld	Transportation
145	Caltrans Undercrossing 55 0287	Bridge – Location Withheld	Transportation
146	Caltrans Diversion Channel 55 0528	Bridge – Location Withheld	Transportation
147	Caltrans Offramp Overhead 55 0472s	Bridge – Location Withheld	Transportation
148	Caltrans Undercrossing 55 0296l	Bridge – Location Withheld	Transportation
149	Caltrans Undercrossing 55 0296r	Bridge – Location Withheld	Transportation
150	Caltrans Undercrossing 55 0296f	Bridge – Location Withheld	Transportation
151	Caltrans Undercrossing 55 0464	Bridge – Location Withheld	Transportation
152	Caltrans Undercrossing 55 0483	Bridge – Location Withheld	Transportation
153	Caltrans Overhead Separation 55 0293l	Bridge – Location Withheld	Transportation
154	Caltrans Overhead 55 0468	Bridge – Location Withheld	Transportation
155	Extraction Well (1)	Well – Location Withheld	Water Systems
156	Extraction Well (2)	Well – Location Withheld	Water Systems

ID	NAME	CRITICAL FACILITY TYPE	COMMUNITY LIFELINE
157	Extraction Well (3)	Well – Location Withheld	Water Systems
158	Extraction Well (4)	Well – Location Withheld	Water Systems
159	Extraction Well (5)	Well – Location Withheld	Water Systems
160	Extraction Well (6)	Well – Location Withheld	Water Systems
161	Extraction Well (7)	Well – Location Withheld	Water Systems
162	Extraction Well (8)	Well – Location Withheld	Water Systems
163	Injection Well (1)	Well – Location Withheld	Water Systems
164	Injection Well (2)	Well – Location Withheld	Water Systems
165	Injection Well (3)	Well – Location Withheld	Water Systems
166	Injection Well (4)	Well – Location Withheld	Water Systems
167	Injection Well (5)	Well – Location Withheld	Water Systems

TABLE 3-10: FACILITIES OF CONCERN

ID	NAME	FACILITY TYPE	COMMUNITY LIFELINE
1	Buena Park High School	Education	Safety and Security
2	Fullerton Union High School	Education	Safety and Security
3	La Habra High School	Education	Safety and Security
4	La Sierra High School	Education	Safety and Security
5	La Vista High School	Education	Safety and Security
6	Sonora High School	Education	Safety and Security
7	Sunny Hills High School	Education	Safety and Security
8	Troy High School	Education	Safety and Security
9	Acacia Elementary School	Education	Safety and Security
10	Beechwood School	Education	Safety and Security
11	Commonwealth Elementary School	Education	Safety and Security
12	Fern Drive Elementary School	Education	Safety and Security
13	Robert C. Fisler School	Education	Safety and Security
14	Golden Hill Elementary School	Education	Safety and Security
15	Hermosa Drive Elementary School	Education	Safety and Security
16	Ladera Vista Junior High School Of The Arts	Education	Safety and Security
17	Laguna Road Elementary School	Education	Safety and Security

ID	NAME	FACILITY TYPE	COMMUNITY LIFELINE
18	Maple Elementary School	Education	Safety and Security
19	Nicolas Junior High School	Education	Safety and Security
20	Orangethorpe Elementary School	Education	Safety and Security
21	Pacific Drive Elementary School	Education	Safety and Security
22	Parks Jr High School	Education	Safety and Security
23	Raymond Elementary School	Education	Safety and Security
24	Richman Elementary School	Education	Safety and Security
25	Rolling Hills Elementary School	Education	Safety and Security
26	Sunset Lane Elementary School	Education	Safety and Security
27	Valencia Park Elementary School	Education	Safety and Security
28	Woodcrest Elementary School	Education	Safety and Security
29	California State University, Fullerton	Education	Safety and Security
30	Fullerton College	Education	Safety and Security
31	Hope University	Education	Safety and Security
32	Marshall B. Ketchum University	Education	Safety and Security
33	Ruby Drive Elementary	Education	Safety and Security
34	Sierra Vista Elementary School	Education	Safety and Security
35	Topaz Elementary School	Education	Safety and Security
36	Kids Adventure Learning Center	Education	Safety and Security
37	Stepping Stones Academy	Education	Safety and Security
38	St Juliana Falconieri School	Education	Safety and Security
39	Arborland Montessori School - Valencia Campus	Education	Safety and Security
40	Arborland Montessori School - Hughes Campus	Education	Safety and Security
41	Ivycrest Montessori	Education	Safety and Security
42	Eastside Christian	Education	Safety and Security
43	Rosary Academy	Education	Safety and Security
44	James A. Whitaker Elementary	Education	Safety and Security
45	Sunnycrest Senior Living	Healthcare/Assisted Living Facility	Health and Medical
46	Sunrise of Fullerton	Healthcare/Assisted Living Facility	Health and Medical
47	Park Vista	Healthcare/Assisted Living Facility	Health and Medical
48	Acacia Villas Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
49	Cambridge Court Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
50	Fullerton Rosewood Assisted	Healthcare/Assisted Living Facility	Health and Medical
51	Oasis Assisted Senior Living	Healthcare/Assisted Living Facility	Health and Medical
52	Glencrest Manor	Healthcare/Assisted Living Facility	Health and Medical

ID	NAME	FACILITY TYPE	COMMUNITY LIFELINE
53	Applecrest Homes Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
54	Glenwood Care Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
55	D'Best Care Board and Care	Healthcare/Assisted Living Facility	Health and Medical
56	Senior Living Community	Healthcare/Assisted Living Facility	Health and Medical
57	Cherub Home	Healthcare/Assisted Living Facility	Health and Medical
58	Fullerton Gardens	Healthcare/Assisted Living Facility	Health and Medical
59	Kindred Hospital Brea - Subacute	Healthcare/Assisted Living Facility	Health and Medical
60	Gordon Lane Convalescent Hospital	Healthcare/Assisted Living Facility	Health and Medical
61	Terrace View Care Center	Healthcare/Assisted Living Facility	Health and Medical
62	The Pavilion at Sunny Hills	Healthcare/Assisted Living Facility	Health and Medical
63	Windsor Garden of Fullerton	Healthcare/Assisted Living Facility	Health and Medical
64	Genesis - St. Elizabeth Healthcare and Rehabilitation Center	Healthcare/Assisted Living Facility	Health and Medical
65	Greenfield Care Center	Healthcare/Assisted Living Facility	Health and Medical
66	Park Vista at Morningside	Healthcare/Assisted Living Facility	Health and Medical
45	Sunnycrest Senior Living	Healthcare/Assisted Living Facility	Health and Medical
46	Sunrise of Fullerton	Healthcare/Assisted Living Facility	Health and Medical
47	Park Vista	Healthcare/Assisted Living Facility	Health and Medical
48	Acacia Villas Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
49	Cambridge Court Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
50	Fullerton Rosewood Assisted	Healthcare/Assisted Living Facility	Health and Medical
51	Oasis Assisted Senior Living	Healthcare/Assisted Living Facility	Health and Medical
52	Glencrest Manor	Healthcare/Assisted Living Facility	Health and Medical
53	Applecrest Homes Assisted Living	Healthcare/Assisted Living Facility	Health and Medical

ID	NAME	FACILITY TYPE	COMMUNITY LIFELINE
54	Glenwood Care Assisted Living	Healthcare/Assisted Living Facility	Health and Medical
55	D'Best Care Board and Care	Healthcare/Assisted Living Facility	Health and Medical
56	Senior Living Community	Healthcare/Assisted Living Facility	Health and Medical
57	Cherub Home	Healthcare/Assisted Living Facility	Health and Medical
58	Fullerton Gardens	Healthcare/Assisted Living Facility	Health and Medical
59	Kindred Hospital Brea - Subacute	Healthcare/Assisted Living Facility	Health and Medical
60	Gordon Lane Convalescent Hospital	Healthcare/Assisted Living Facility	Health and Medical
61	Terrace View Care Center	Healthcare/Assisted Living Facility	Health and Medical
62	The Pavilion at Sunny Hills	Healthcare/Assisted Living Facility	Health and Medical
63	Windsor Garden of Fullerton	Healthcare/Assisted Living Facility	Health and Medical
64	Genesis - St. Elizabeth Healthcare and Rehabilitation Center	Healthcare/Assisted Living Facility	Health and Medical
65	Greenfield Care Center	Healthcare/Assisted Living Facility	Health and Medical
66	Park Vista at Morningside	Healthcare/Assisted Living Facility	Health and Medical
67	Santa Ana Armory Cold Weather Shelter	Community Services	Safety and Security
68	Women's Transitional Living Center	Community Services – Location Withheld	Safety and Security
69	New Vista Immediate Response Housing	Community Services – Location Withheld	Safety and Security

3.8 WHOLE COMMUNITY AND ACCESS AND FUNCTIONAL NEEDS

3.8.1 RESEARCH AND METHODOLOGY

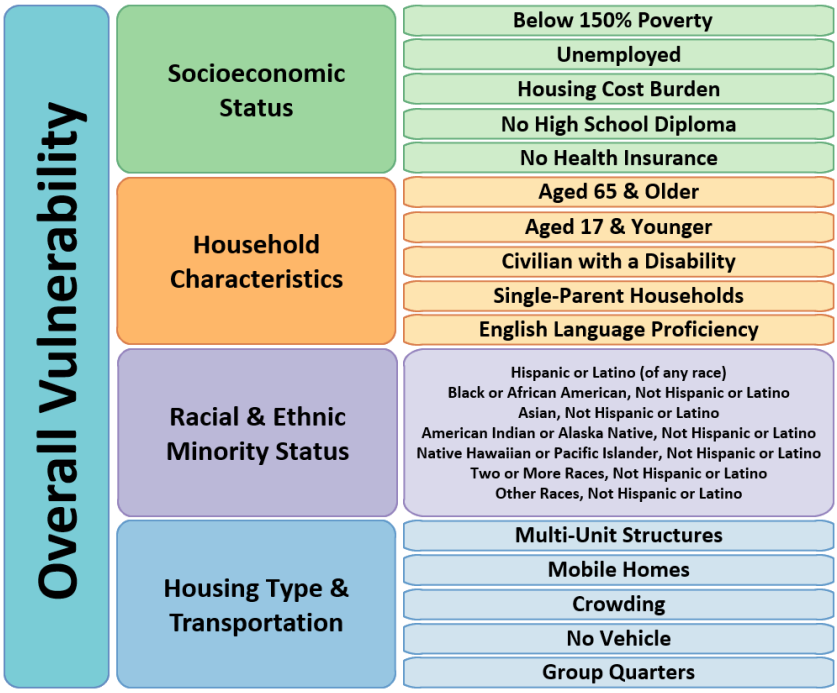
The FEMA Whole Community approach is a foundational philosophy in emergency management that emphasizes inclusive collaboration across all sectors of society to enhance national preparedness and resilience. This planning process incorporated principles from the Whole Community approach specifically to recognize community capabilities and needs, particularly identifying access and functional needs within the planning area. Access and Functional Needs (AFN) refer to individuals who may require additional assistance before, during and after an emergency due to limitations in abilities to access services or function

independently. Characteristics that contribute to AFN can include, but are not limited to: disability status, age (children or senior citizens), limited English proficiency, limited transportation access, or are otherwise economically disadvantaged. These characteristics may be temporary or permanent to be considered AFN. The LHMP Planning Team identified planning for AFN as a core priority for the LHMP Update.

To identify individuals with AFNs, US Census Tract and American Community Survey data was utilized. The City of Fullerton includes a total of 37 census tracts, though 15 census tracts includes geographies outside of the City jurisdiction (such as neighboring jurisdictions of La Habra, Brea, Placentia, Anaheim and Buena Park). Because these census tracts include portions of land in adjacent jurisdictions, some data may be distorted or skewed for the portion within the City of Fullerton. As a result, demographic information for these tracts reflects neighboring communities as well as Fullerton.

The LHMP Planning Team utilized the two separate data sets to identify individuals with AFN within the City of Fullerton. These data sources included Center for Disease Control (CDC) Vulnerability Index and the California Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen 4.0. Both datasets measure individual characteristics that contribute to AFN, such as age, disability status, and English proficiency. A key differentiator between the CDC Vulnerability Index and CalEnviroScreen 4.0 is that CDC data primarily focuses on socioeconomic indicators, whereas CalEnviroScreen 4.0 also measures impacts from environmental pollution. The socioeconomic indicators measured by both indices are included in **Figure 3-2: Vulnerability Index Themes** below.

FIGURE 3-2: VULNERABILITY INDEX THEMES



Source: Center of Disease Control/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index (SVI), https://www.atsdr.cdc.gov/place-health/php/svi/index.html, accessed November 3, 2025.

Additionally, it is noted there is a difference in the naming convention for census tracts between the CDC Vulnerability Index and CalEnviroScreen 4.0 dataset. The CDC shows Census Tracts 001603 and 001604 in the central northern portion of the City; CalEnviroScreen shows this area as one combined census tract—Census Tract 001601. Also, the CDC vulnerability index identifies the northwesternmost census tract in the City as Census Tract 001710; CalEnviroScreen identifies this as Census Tract 001707. The remaining census tracts in Fullerton are consistent between the CDC vulnerability index and CalEnviroScreen.

CDC VULNERABILITY INDEX

Figure 3-3: CDC Vulnerability Index by Census Tract shows the CDC vulnerability index scores for census tracts within the City. These scores are based on a nationwide comparison of census tracts, allowing Fullerton to assess how its communities rank relative to others across the country. This benchmarking is especially valuable for hazard mitigation planning, as it aligns with federal grant criteria and informs eligibility for programs such as FEMA's hazard mitigation assistance.

Table 3-11: Fullerton Overall Vulnerability Index Scores shows the overall score and level of vulnerability for census tracts within the City. Possible scores range from 0 (lowest vulnerability) to 1 (highest vulnerability) and are classified into four categories:

- Low vulnerability: 0.00 – 0.25
- Low to medium vulnerability: 0.25 – 0.50
- Medium to high vulnerability: 0.50 – 0.75
- High vulnerability: 0.75 – 1.00

These classifications help identify areas where residents may face disproportionate challenges during emergencies and guide targeted mitigation strategies that promote resilience for the whole community.

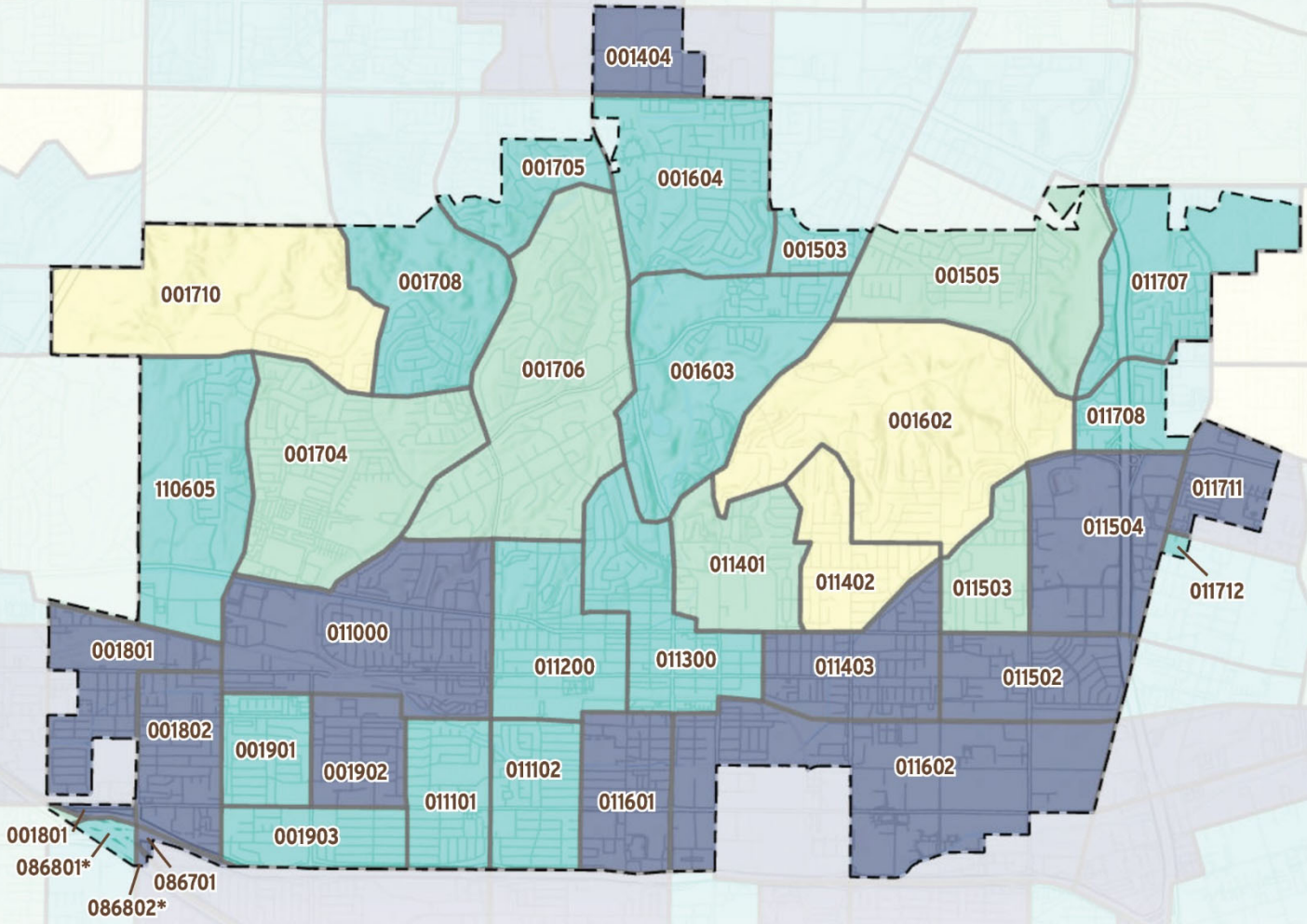
TABLE 3-11: FULLERTON OVERALL VULNERABILITY INDEX SCORES

CENSUS TRACT	VULNERABILITY INDEX SCORES	
	2022 OVERALL SCORE	LEVEL OF VULNERABILITY
001404*	**0.8206**	**High**
001503*	0.6623	Medium-High
001505*	0.3804	Low-Medium
001602	0.1921	Low
001603	0.5064	Medium-High
001604	0.568	Medium-High
001704	0.4093	Low-Medium
001705*	0.7224	Medium-High
001706	0.3803	Low-Medium
001708*	0.5098	Medium-High
001710*	0.1902	Low
001801*	**0.8757**	**High**
001802	**0.9225**	**High**
001901	0.5769	Medium-High
001902	**0.802**	**High**
001903	0.6974	Medium-High
011000	**0.8007**	**High**
011101	0.5214	Medium-High
011102	0.6877	Medium-High
011200	0.6437	Medium-High
011300	0.7457	Medium-High
011401	0.3424	Low-Medium
011402	0.2074	Low
011403	**0.7764**	**High**
011502	**0.8039**	**High**
011503	0.3776	Low-Medium
011504	**0.8396**	**High**
011601	**0.9532**	**High**
011602*	**0.8815**	**High**
011707*	0.6316	Medium-High
011708*	0.7293	Medium-High
011711*	**0.9332**	**High**
011712*	0.641	Medium-High
086701*	**0.8407**	**High**
086801*	0.505	Medium-High
086802*	**0.8351**	**High**
110605	0.577	Medium-High

*Note: Census tracts include portions of land in adjacent jurisdictions.

Source: Center of Disease Control/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index (SVI), https://www.atsdr.cdc.gov/place-health/php/svi/svi-interactive-map.html, accessed August 27, 2025.

Figure 3-3:
CDC Vulnerability Index by Census Tract



Legend

City of Fullerton Municipal Boundary

*Land uses in these portions of census tracts are considered overpasses and parking lots.

Level of Vulnerability

- Low
- Low - Medium
- Medium - High
- High

0 1 mile 2 miles

N

Source: CDC SVI, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83; Data Sourced: 2022

The CDC Vulnerability Index identifies 13 census tracts in Fullerton as having high levels of vulnerability. These census tracts are geographically concentrated in the southeast, southwest, and northernmost portions of the City. Land uses within these census tracts include significant industrial zones, buffered by commercial and residential zones (at varying densities). Census tracts in the southeast and southwest are also adjacent to major freeways, including SR-57 and SR-91.

Census tracts within the City indicate vulnerability based on 16 indicators identified in the vulnerability index including socioeconomic status, household characteristics, racial/ethnic minority status and housing type/transportation. The index flags census tracts in the top ten percent (i.e., the 90th percentile) for these demographic, socioeconomic and housing indicators to indicate a high level of vulnerability. According to the CDC Vulnerability Index, characteristics contributing to high levels of vulnerability include:

- Persons aged 65 and older (including those with a disability)
- Linguistic isolation
- Households in multi-unit housing
- Crowded households
- Persons in group quarters

These characteristics are generally reflective of individuals with increased AFN during and after a disaster. Additionally, these characteristics were reflected in census tracts reporting lower levels of vulnerability and therefore indicate patterns of AFN across the planning area. Consideration for the AFN characteristics as related to this LHMP and overall mitigation strategies are outlined below:

- Age and disability are closely linked, particularly in relation to ambulatory, cognitive, and independent living difficulties. According to the City of Fullerton's Housing Element, nearly 10 percent of the City's population, live with one or more disabilities. The most reported types include independent living difficulty, cognitive difficulty, and ambulatory difficulty, followed by hearing, self-care, and vision impairments. Assisted living facilities are noted within Census Tracts 001706, 011000, 001802. These concentrations suggest localized areas where older adults and individuals with disabilities may be more reliant on institutional support and infrastructure. These residents may face unique barriers to preparedness, evacuation, response and recovery.
- Limited English proficiency and linguistic isolation, which affects Census Tracts 001404, 001801, 001802, 011601, 011602, 086701, and 086802. Limited English proficiency is defined as persons (age 5+) who speak English "less than well". Residents in linguistically isolated households may face significant barriers to accessing emergency information, public services, and disaster preparedness resources. During fast-moving hazard events such as wildfires or flash floods, delays in receiving or understanding evacuation orders can increase exposure to danger. In some households, younger family members serve as informal translators for older relatives, but this dynamic may break down during emergencies. Linguistic isolation

often overlaps with other vulnerability factors, compounding the risks faced by these communities.

- Crowded households are another significant vulnerability factor, present all identified high-vulnerability tracts. A crowded household is defined by the U.S. Census Bureau as an occupied housing unit where the number of people exceeds the number of rooms available for living. Inherently, when more individuals are concentrated in a single housing unit, more people are vulnerable to hazard impacts. Additionally, crowding can exacerbate health risks, limit personal space for sheltering in place, and complicate evacuation logistics. Crowded households may also reflect underlying economic hardship, which can reduce ability to prepare for or recover from disasters.
- Similarly, multi-unit housing (defined by CDC as residential structures containing 10 or more units) show increased exposure to hazards. These buildings often have shared infrastructure, limited access points, and higher population densities, which can slow evacuation and increase the need for public safety agency response. simultaneously. Residents may also face barriers to receiving individualized assistance, particularly in large complexes where emergency personnel must navigate multiple units and floors. Damage to a single structure may displace dozens or even hundreds of residents at once. These buildings may also house renters or students (particularly near CSU Fullerton or Fullerton College) who lack access to insurance, transportation, or long-term recovery resources.
- Last, Census Tracts 001902 and 011504 show a notable presence of persons living in group quarters. Group quarters refer to managed residential facilities where individuals reside outside of traditional household settings and are often provided with custodial, medical, or institutional care. These include dormitories, nursing homes, assisted living facilities, and other congregate living environments. Census Tract 011504, located in the eastern portion of the City adjacent to California State University, Fullerton, is primarily zoned for medium-density residential uses and likely includes student housing and university-affiliated dormitories. Other forms of institutional housing, such as elder care or nursing facilities, reflecting the broader presence of older adults and individuals with disabilities are located throughout Fullerton. These populations are often dependent on facility staff for mobility, communication, and emergency response, making them particularly vulnerable if staff are unavailable or overwhelmed during a disaster. In dormitory settings, students may lack access to personal transportation, emergency supplies, or local support networks.

CALENVIROSCREEN 4.0

In addition to the CDC vulnerability index, the LHMP Planning Team utilized the CalEPA DAC criteria based on CalEnviroScreen 4.0 to evaluate the presence of populations with AFN. CalEPA uses indicators such as pollution burden and population characteristics listed in **Table 3-12: CalEnviroScreen 4.0 Indicators**. As noted earlier, there are minor differences in census tract numbering between the CDC vulnerability index and CalEnviroScreen 4.0. Specifically, the CDC splits the central northern area into Tracts 001603 and 001604, while CalEnviroScreen combines it as Tract 001601. Additionally, the northwesternmost tract is labeled 001710 by

the CDC and 001707 by CalEnviroScreen. All other tracts in Fullerton align across both datasets.

TABLE 3-12: CALENVIROSCREEN 4.0 INDICATORS

CATEGORY	INDICATOR
Pollution Burden	Ozone
	PM2.5
	Diesel Particulate Matter
	Drinking Water Contaminants
	Children's Lead Risk from Housing
	Pesticide Use
	Toxic Releases from Facilities
	Traffic Impacts
	Cleanup Sites
	Groundwater Threats
	Hazardous Waste
	Impaired Waters
	Solid Waste Sites
Population Characteristics	Asthma
	Cardiovascular Disease
	Low Birth Weight
	Education
	Housing Burden
	Linguistic Isolation
	Poverty
	Unemployment

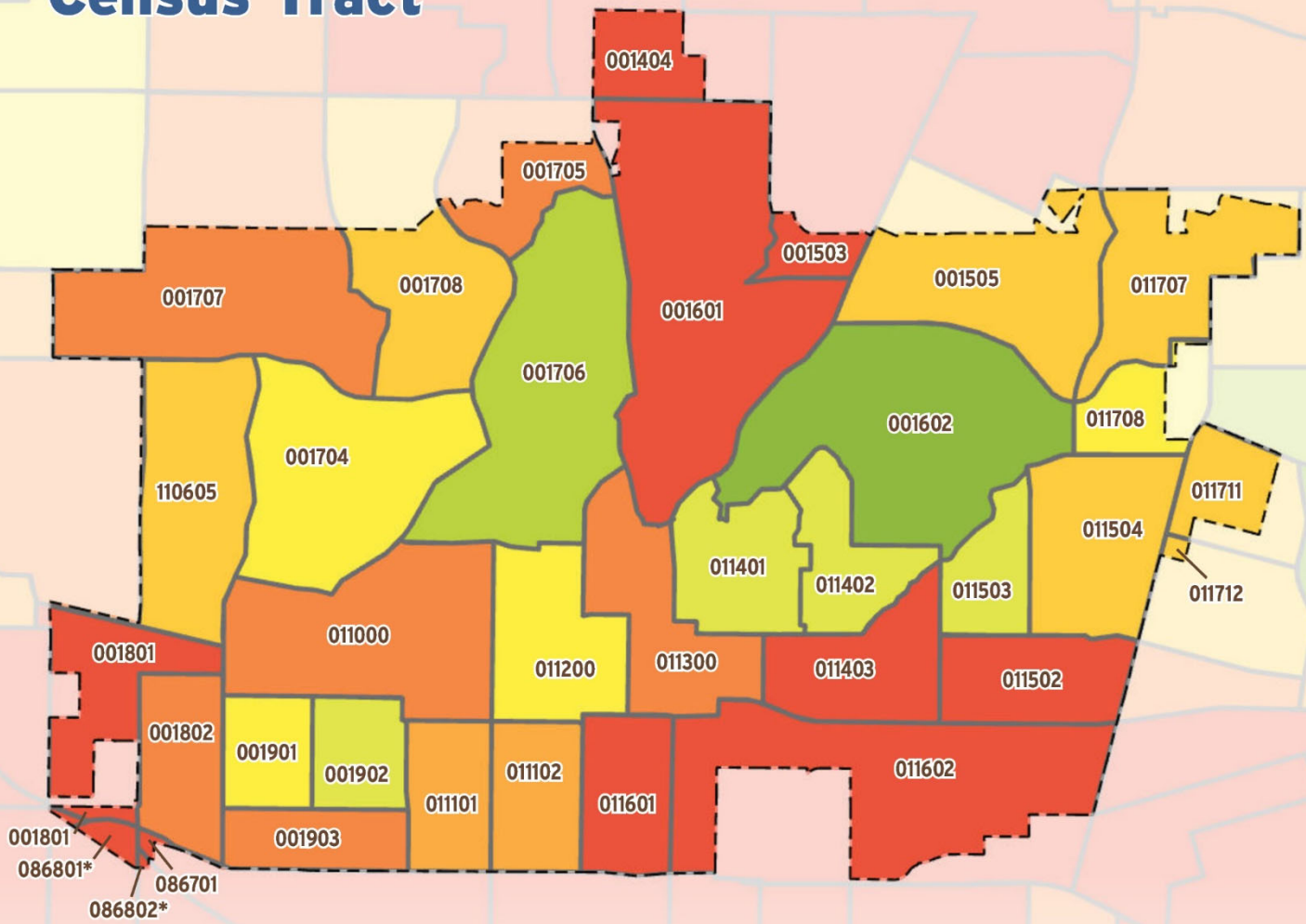
Source: State of California OEHHA, CalEnviroScreen 4.0 Excel and Data Dictionary, https://oehha.ca.gov/calenviroscreen/maps-data, access August 27, 2025.

Figure 3-4: CalEnviroScreen 4.0 Pollution Burden by Census Tract illustrates pollution burden by census tract in the City of Fullerton. Pollution burden is assessed based on multiple environmental indicators shown in **Table 3-12**. The map reveals varying levels of pollution burden across census tracts, with vulnerability ranging from low (green) to high (red) based on specific indicators.

Census tracts most impacted by pollution burden include 001404, 001601, 001503, 011403, 011502, 011601, 011602, 001801, 086801, 086802, and 086701. Notably, several of these tracts extend beyond the City boundaries, indicating that land uses in adjacent jurisdictions, such as neighboring industrial zones, transportation corridors, and commercial centers, may be contributing to elevated pollution scores within Fullerton.

Areas with the highest pollution burdens are predominantly located in the southeast, west, and northernmost parts of the city. These regions correspond closely with industrial land uses and major transportation corridors. This spatial overlap suggests a strong correlation between industrial activity and elevated pollution exposure.

Figure 3-4:
CalEnviroScreen 4.0 Pollution Burden by Census Tract



Legend

City of Fullerton Municipal Boundary

*Land uses in these portions of census tracts are considered overpasses and parking lots.

Level of Vulnerability

- >0-10
- >10-20
- >20-30
- >30-40
- >40-50
- >50-60
- >60-70
- >70-80
- >80-90
- >90-100

0 1 mile 2 miles

N

Source: Cal OEHHA, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83; Data Sourced: 2021

Many of the tracts with high pollution burden also overlap with those flagged for populations with limited adaptive capacity and AFN, as identified by the CDC vulnerability index. For example, Census Tracts 001404, 001801, 001802, 011601, 011602, and 086701 are not only environmentally burdened but also contain high concentrations of older adults, individuals with disabilities, linguistically isolated households, and residents in crowded or multi-unit housing. These findings are generally consistent with socioeconomic data reflected by the CDC Vulnerability Index. These overlapping vulnerabilities compound risk, as residents in these areas may face greater difficulty evacuating, accessing emergency information, or recovering from hazard events.

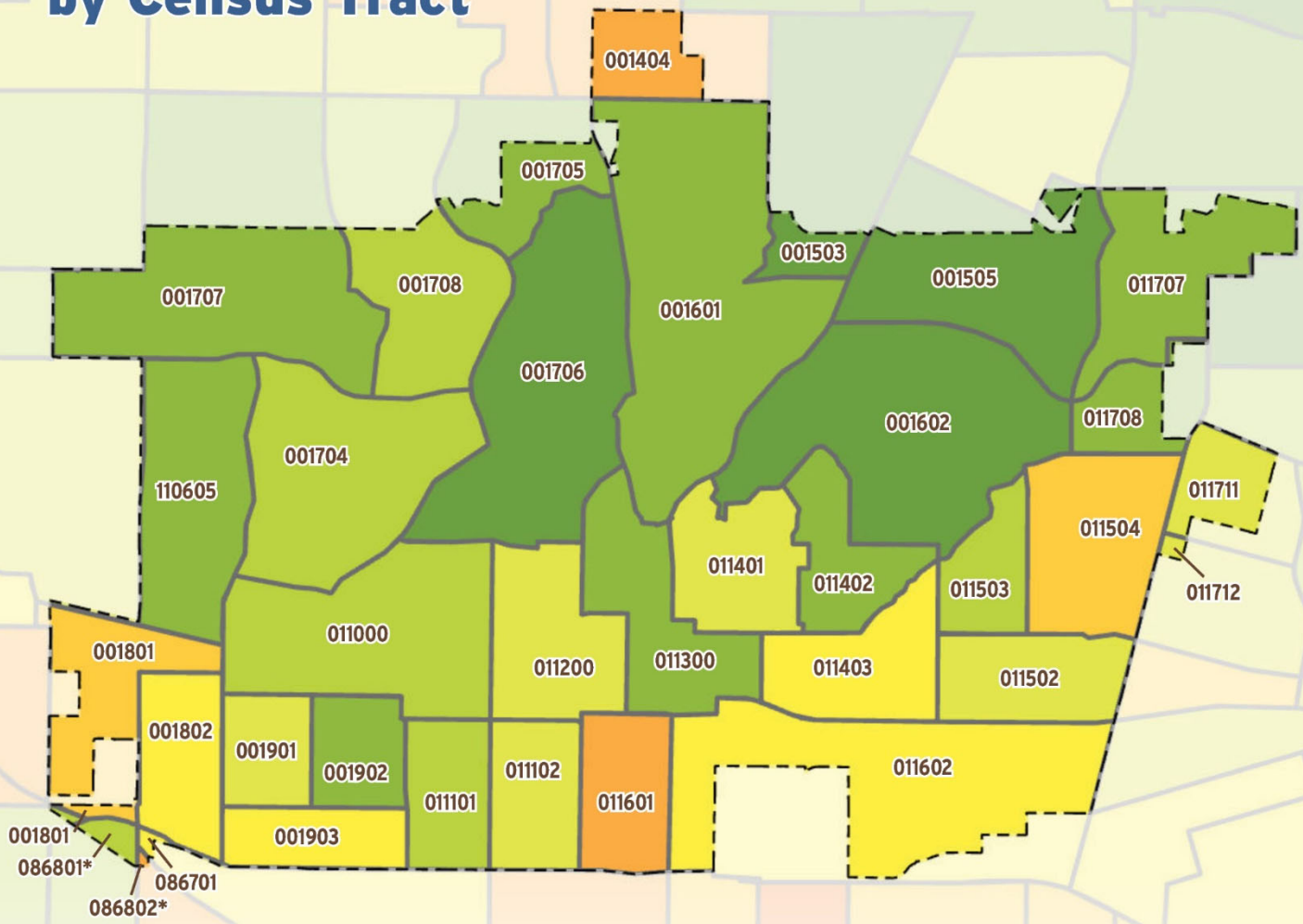
Figure 3-5: CalEnviroScreen 4.0 Population Characteristics by Census Tract illustrates vulnerability across census tracts in Fullerton, based on population indicators. Vulnerability levels are color-coded from low (green) to high (red), representing percentile scores. The indicators used to assess vulnerability include health and socioeconomic factors such as asthma, cardiovascular disease, low birth weight, education levels, housing burden, linguistic isolation, poverty, and unemployment. Census tracts with higher vulnerability scores tend to reflect communities facing compounded health and social challenges.

Census Tracts 001404, 011504, 011601, and 011801 are among the most impacted by population vulnerability indicators. Census Tracts 001404 and 001801 primarily include industrial, commercial, low- and medium-density residential land uses; however, these census tracts extend beyond Fullerton's boundaries and may be influenced by demographic and socioeconomic conditions in adjacent jurisdictions. Census Tract 011504 is home to California State University, Fullerton, as well as medium-density residential areas likely occupied by students and renters. Census Tract 011601 contains a mix of low- to high-density residential, commercial, and industrial land uses, suggesting a diverse population with varying levels of vulnerability.

Again, these findings are consistent with those areas also identified by the CDC Vulnerability Index for populations with AFN, older adults, individuals with disabilities, linguistically isolated households, and residents in crowded or multi-unit housing. The convergence of socioeconomic stressors and AFN characteristics in these areas compounds vulnerability during hazard events. For example, residents may lack the preparation and resources to evacuate or recover, while those with limited English proficiency may struggle to access emergency information. In multi-unit or crowded housing, evacuation logistics become more complex, and shared infrastructure can lead to cascading disruptions.

Figure 3-6: CalEnviroScreen 4.0 Composite Scores by Census Tract and **Table 3-13: Overall CalEnviroScreen 4.0 Percentiles** compile the vulnerability scores.

Figure 3-5:
CalEnviroScreen 4.0 Population Characteristics by Census Tract



Legend

City of Fullerton Municipal Boundary

*Land uses in these portions of census tracts are considered overpasses and parking lots.

Level of Vulnerability

- >0-10
- >10-20
- >20-30
- >30-40
- >40-50
- >50-60
- >60-70
- >70-80
- >80-90
- >90-100

0 1 mile 2 miles

N

Source: Cal OEHHA, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83; Data Sourced: 2021

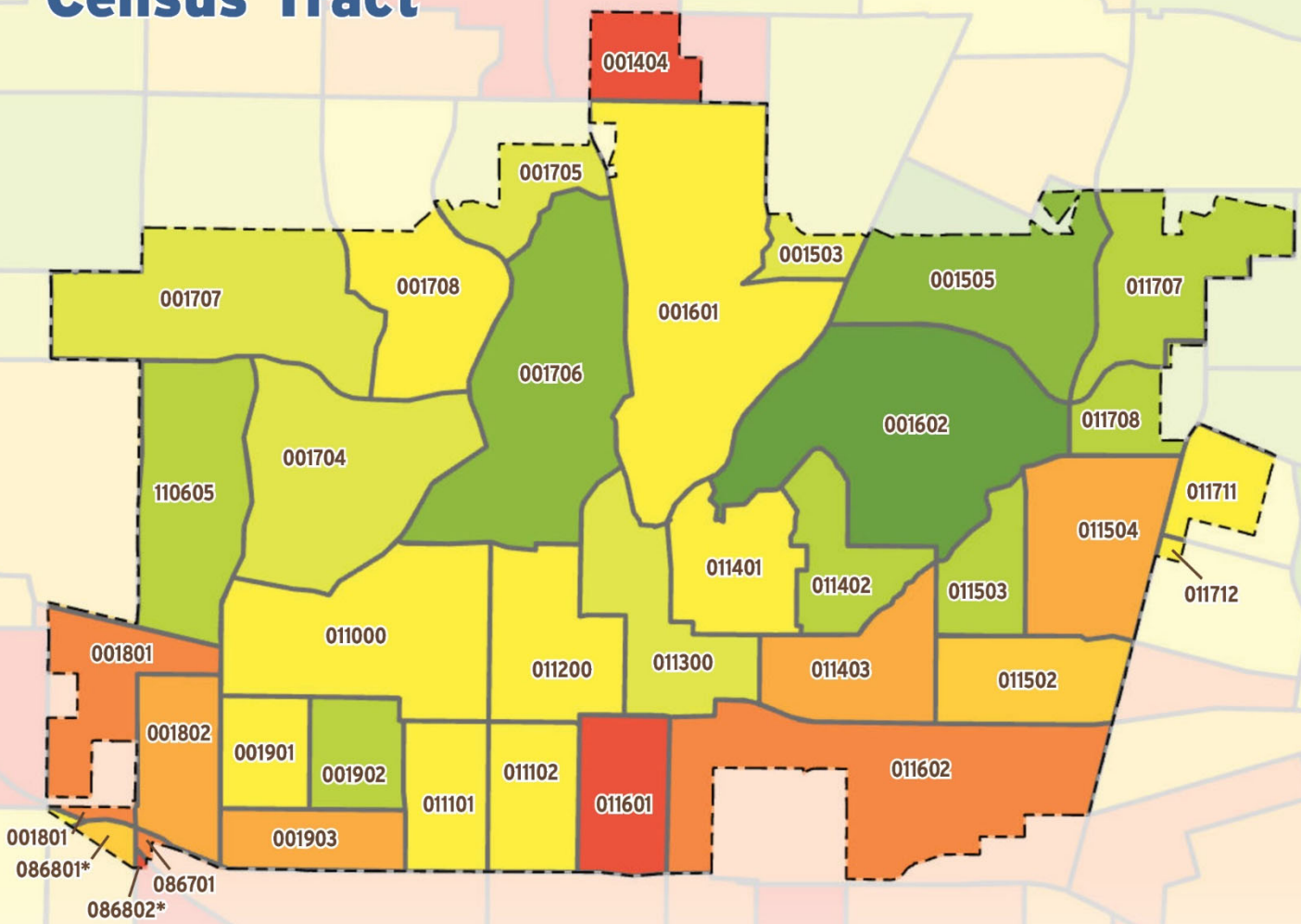
TABLE 3-13: OVERALL CALENVIROSCREEN 4.0 PERCENTILES

CENSUS TRACT	COMPOSITE PERCENTILE	POLLUTION BURDEN PERCENTILE	POPULATION CHARACTERISTICS PERCENTILE
001404*	**92**	95	77
001503*	44	93	19
001505*	27	63	15
001601	50	90	26
001602	13	29	11
001704	41	56	33
001705*	49	89	25
001706	22	35	18
001707*	47	88	24
001708*	52	67	39
001801*	81	90	63
001802	**75**	86	59
001901	53	60	45
001902	35	48	29
001903	73	80	60
011000	60	84	40
011101	52	71	38
011102	59	73	45
011200	50	59	41
011300	45	89	22
011401	51	49	48
011402	34	48	27
011403	**77**	96	51
011502	70	95	43
011503	40	48	34
011504	70	62	69
011601	**95**	97	80
011602*	**88**	100	54
011707*	39	67	25
011708*	37	58	27
011711*	57	60	49
011712*	57	61	48
086701*	**81**	95	57
086801*	61	96	32
086802*	**92**	94	76
110605	39	66	25

*Note: Census tracts include portions of land in adjacent jurisdictions.

Source: State of California OEHHA, CalEnviroScreen 4.0 Maps & Data, https://oehha.ca.gov/calenviroscreen/maps-data, access August 27, 2025.

Figure 3-6:
CalEnviroScreen 4.0 Composite Scores by Census Tract



Legend

City of Fullerton Municipal Boundary

*Land uses in these portions of census tracts are considered overpasses and parking lots.

Level of Vulnerability

- >0-10
- >10-20
- >20-30
- >30-40
- >40-50
- >50-60
- >60-70
- >70-80
- >80-90
- >90-100

0 1 mile 2 miles

N

Source: Cal OEHHA, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83; Data Sourced: 2021

In Fullerton, several census tracts exhibit elevated composite scores, with some ranking in the 75th percentile. For example, Census Tract 001404 has a composite percentile of 92, driven by a very high pollution burden (95th percentile) and a moderately high population characteristics score (77th percentile). Similarly, Census Tracts 011601 and 086802 both score in the 90th percentile range for composite vulnerability, reflecting significant environmental pollution and AFN.

3.8.2 VULNERABILITY DETERMINATION

Based on the vulnerability data and other vulnerable populations discussed above, the LHMP Planning Team determined that for the purposes of this LHMP, the following census tracts would be formally established as vulnerable:

- Census tracts identified as having high levels of vulnerability by the CDC (Census Tracts 001404, 001801, 001802, 001902, 011000, 011403, 011502, 011504, 011601, 011602, 011711, 086701).
- Census tracts in the 75th percentile of CalEnviroScreen 4.0 Composite Scores (Census Tracts 001404, 001802, 011403, 011601, 011602, 086701).

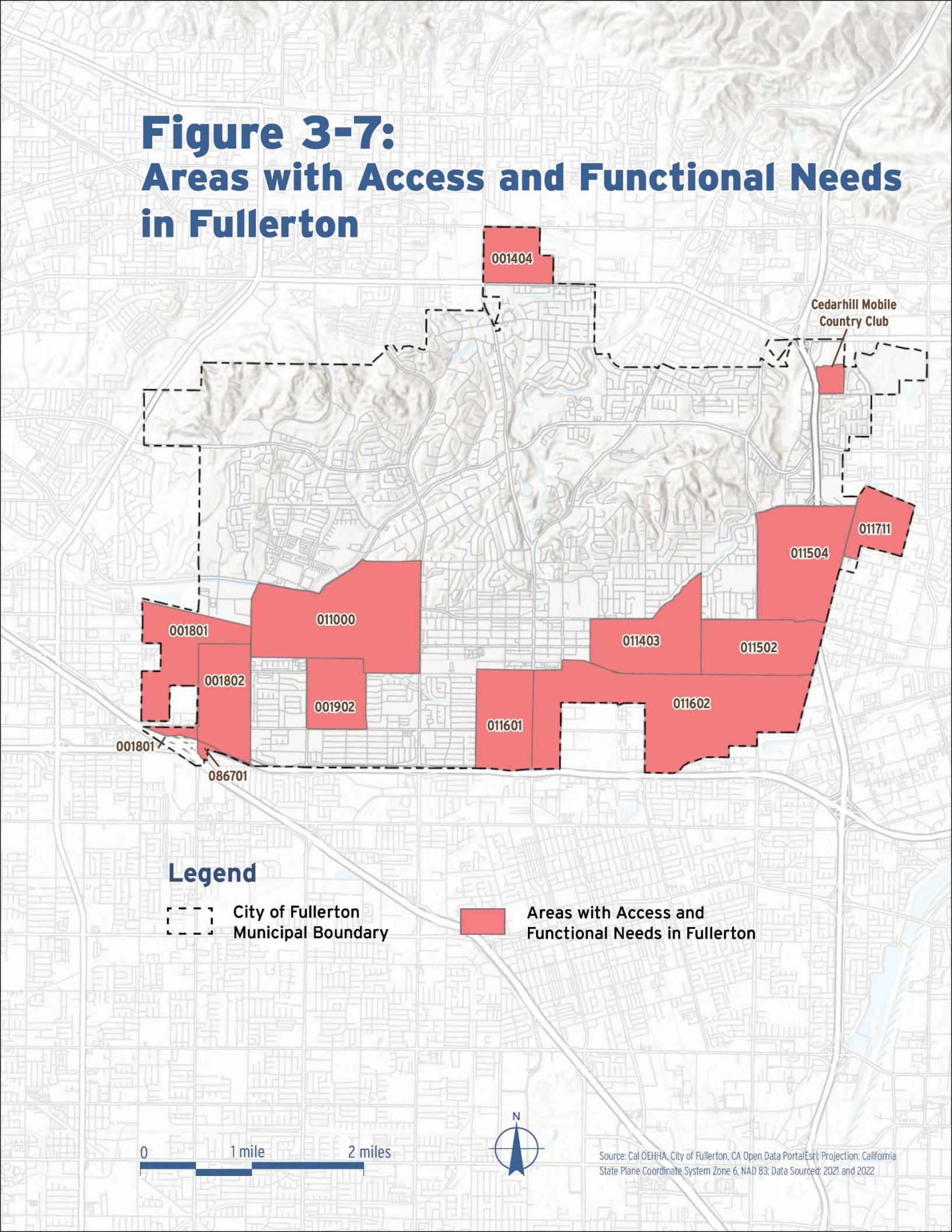
These census tracts contain concentrations of residents with limited adaptive capacity and AFN. These include older adults including some living with a disability, linguistically isolated individuals, and households in multi-unit or crowded living conditions, as well as persons residing in group quarters. When layered with the CalEnviroScreen findings of elevated pollution burden and socioeconomic stressors, these AFN populations face compounded barriers to resilience. These census tracts are shown on **Figure 3-7: Areas with Access and Functional Needs in Fullerton**.

Table 3-15: Vulnerable Populations and Potential Vulnerability outlines key population groups with AFN and the characteristics that may heighten their vulnerability during hazard events. Each group faces distinct challenges that can limit their adaptive capacity, such as reduced mobility, communication barriers, and constrained access to emergency services. Understanding these characteristics is essential for tailoring mitigation strategies to meet the needs of Fullerton's most at-risk communities.

TABLE 3-14: VULNERABLE POPULATIONS AND POTENTIAL VULNERABILITY

VULNERABLE POPULATIONS	POTENTIAL CHARACTERISTICS THAT ENHANCE VULNERABILITY
Persons aged 65 and older	Limited mobility, chronic health conditions, social isolation, reduced access to emergency information or services
Linguistic isolation	Difficulty understanding emergency communications, limited access to resources, social isolation, reduced advocacy
Households in multi-unit housing	Shared infrastructure, limited evacuation options, increased exposure to hazards (e.g., fire, disease spread)
Crowded households	Limited personal space, higher risk of disease transmission, resource scarcity, difficulty sheltering in place
Persons in group quarters	Institutional constraints, limited autonomy, shared facilities, higher exposure to communicable diseases

Figure 3-7:
Areas with Access and Functional Needs in Fullerton



Source: Cal OEHHA, City of Fullerton, CA Open Data PortalEsri; Projection: California State Plane Coordinate System Zone 6, NAD 83; Data Sourced: 2021 and 2022

4 HAZARDS ASSESSMENT

WHAT'S DIFFERENT ABOUT THE 2026 PLAN?

- All hazards from the previous LHMP continued into this LHMP Update; hazards were reorganized for clarity.
- Vulnerability assessments were enhanced to include considerations for changes in land use and population patterns, along with considerations for individuals with access and functional needs (AFN).

SECTION 4: HAZARDS ASSESSMENT

4.1 HAZARD IDENTIFICATION AND PRIORITIZATION

4.1.1 HAZARD IDENTIFICATION

The first step in developing the vulnerability and risk assessment is hazard identification. The LHMP Planning Team reviewed the previously prepared 2020 City of Fullerton Hazard Mitigation Plan, hazard mitigation plans from neighboring jurisdictions, and other relevant information to determine the extent of natural and human caused hazards with potential to affect the City; refer to **Table 2-5: Existing Plans, Studies, Reports, and Other Technical Data/Information**. A discussion of potential hazards during the first LHMP Planning Team meeting resulted in the identification of the natural hazards that pose a potential risk to the City of Fullerton. **Table 4-1: Fullerton Hazard Identification** summarizes the Planning Team's discussion of each of the natural hazards and indicates those identified for inclusion in the LHMP.

TABLE 4-1: FULLERTON HAZARD IDENTIFICATION

LIST OF HAZARDS	IDENTIFIED IN PREVIOUS LHMP	INCLUDED IN UPDATED LHMP	DISCUSSION SUMMARY
Avalanche	No	No	The LHMP Planning Team determined that there is no threat of avalanche to Fullerton due to the City's location and climate.
Aircraft Incident	Yes	Yes	Aircraft incidents are a potential risk to Fullerton. This hazard is included in the human-caused hazards profile.

LIST OF HAZARDS	IDENTIFIED IN PREVIOUS LHMP	INCLUDED IN UPDATED LHMP	DISCUSSION SUMMARY
Civil Unrest	Yes	Yes	The LHMP Planning Team determined that civil unrest should be included in the LHMP. This hazard is included in the human-caused hazards profile.
Coastal Erosion	No	No	Fullerton is not a coastal city and is not affected by coastal erosion.
Coastal Storms	No	No	Fullerton is not a coastal city and is not affected by coastal storms.
Cyber Threats	Yes	Yes	The LHMP Planning Team determined that cyber threats should be included in the LHMP. This hazard is included in the human-caused hazards profile.
Dam Failure	Yes	Yes	Fullerton is within the dam inundation areas for multiple dams in the region.
Drought	Yes	Yes	Droughts are a recurring and potentially severe hazard in Fullerton. This hazard is included in the extreme weather hazard profile.
Expansive Soils	No	No	There are no expansive soil issues identified in Fullerton.
Extreme Heat	Yes	Yes	The LHMP Planning Team determined that extreme heat is a hazard of concern to Fullerton. This hazard is included in the extreme weather hazard profile.
Flood	Yes	Yes	Flood is a potential threat to Fullerton and has historically impacted the City.
Hailstorm	No	No	The LHMP Planning Team determined that hailstorms do not pose a significant risk to Fullerton based upon limited previous occurrences.
Human-Caused Hazards	Yes	Yes	Human-caused hazards are a potential threat to Fullerton and have historically impacted the planning area. Human-caused hazards include aircraft/transportation/train incidents, hazardous materials release, terrorism/cybersecurity/active shooter, civil unrest, vector-borne disease, and pandemic.
Hurricane	No	No	Fullerton has never been significantly affected by a hurricane.
Landslide and Slope Failure	Yes	Yes	Landslide and slope failure is a potential threat to Fullerton and has historically impacted the City.
Lightning	No	No	The LHMP Planning Team determined that lightning does not pose a significant risk to

LIST OF HAZARDS	IDENTIFIED IN PREVIOUS LHMP	INCLUDED IN UPDATED LHMP	DISCUSSION SUMMARY
			the City based upon limited previous occurrences
Sea Level Rise	No	No	Fullerton is not a coastal city and is not affected by sea level rise.
Seismic Hazards	Yes	Yes	Seismic hazards pose a potential threat to Fullerton and have historically impacted the City. Seismic hazards include fault rupture, ground shaking and liquefaction.
Severe Weather Hazards	Yes	Yes	Severe weather hazards are a potential threat to Fullerton and have historically impacted the planning area. Severe weather hazards include drought, extreme heat, severe winds/Santa Ana winds, heavy rain, and power outage/utility failure.
Tornado	Yes	No	While the previous LHMP included tornado, the LHMP Planning Team determined that tornado is a minimal risk to Fullerton and tornado risks are adequately addressed by other severe weather hazards in this LHMP.
Tsunami	No	No	Fullerton is not a coastal city and is not at risk of tsunami.
Urban Fire	Yes	Yes	Fullerton has a history of urban fires that can endanger public safety and health. This is jointly discussed with wildfires hazards.
Vector-Borne Disease and Pandemic	Yes	Yes	The LHMP Planning Team determined that vector-borne disease and pandemic poses a threat to Fullerton.
Volcano	No	No	There are no volcanoes near enough to Fullerton to reasonably pose a threat.
Wildfire	Yes	Yes	Wildfires in Fullerton are likely due to a large amount of open and natural spaces in the city. This is jointly discussed with urban fire hazards.
Windstorm	Yes	Yes	The LHMP Planning Team determined this hazard poses a risk to Fullerton. Windstorm is included in the severe weather hazards profile.

4.1.2 HAZARD PRIORITIZATION

The LHMP Planning Team built off the hazard prioritization of the previous plan which used a spreadsheet-based tool to prioritize the identified hazards by assigning each hazard a ranking based on probability of occurrence and magnitude of potential impact. Hazard rankings were

assigned based on a group discussion, knowledge of past occurrences, and familiarity with the City's vulnerabilities. Four criteria were used to establish the hazard priorities to be addressed in the LHMP:

- Probability (likelihood of occurrence)
- Location (size of potentially affected area)
- Maximum Probable Extent (intensity of damage)
- Secondary impacts (severity of impacts to community

A value from one to four was assigned for each criterion by hazard, where one is the lowest and four is the highest. The assigned values for each criterion were multiplied by weighted factors to obtain a weighted score for each criterion. Weighted factors were based on the LHMP Planning Team's opinion of each criterion's importance. A higher weight was given to the criterion considered more important or significant. For example, the probability of the hazard occurrence received a higher weight than the potential secondary impacts. Probability carries an importance factor of 2.0; location, an importance factor of 0.8; maximum probable extent a factor of 0.7; and secondary impacts a factor of 0.5; refer to **Table 4-2: Hazard Ranking Methodology**.

The weighted scores for location, maximum probable extent (anticipated damage), and secondary impacts for each hazard were added together to determine the total impact score. The total impact score was then multiplied by the weighted probability score to determine the final score. The final scores were used to determine the prioritization of each hazard based on the following FEMA recommended scale:

- Low Threat: 0 to 12;
- Medium Threat: 12.1 to 42; and
- High Threat: 42.1 to 64.

To support the LHMP update, the LHMP Planning Team revisited the hazard rankings established in the previous plan. During Stakeholder Meeting #1, participants reviewed the prior hazard prioritization and engaged in a live polling exercise to reassess perceived risk and vulnerability across the identified hazards. This interactive poll provided an opportunity for individual input and group reflection based on recent experiences, evolving conditions, and current understanding of City vulnerabilities.

The results of the poll indicated that perceived risk and vulnerability for Seismic Hazards, Dam Failure, Geologic Hazards, and Flood remained consistent with previous assessments. As such, no changes were made to the scores or priority levels for these hazards. However, the poll revealed increased concern and perceived risk for Wildfire/Urban Fire, Extreme Weather, and Human-Caused Hazards. In response, the LHMP Planning Team conducted a focused discussion during Focus Meeting #1 to reevaluate and update the probability and impact scores for these hazards. These updates reflect a shift in stakeholder perception and a recognition of emerging threats to the community.

TABLE 4-2: HAZARD RANKING METHODOLOGY

PROBABILITY, LOCATION, MAXIMUM PROBABLE EXTENT AND SECONDARY IMPACTS	
Probability (2.0): Estimated likelihood of occurrence from historical data.	
Probability	**Score**
Unlikely – less than 1% probability in next 100 years; recurrence interval of greater than every 100 years	1
Somewhat Likely – between 1% - 10% probability in next year; recurrence interval of 11 to 100 years	2
Likely – between 10% - 100% probability in next year; recurrence interval of 10 years or less	3
Highly Likely – near 100% probability in next year or happens every year	4
Location (0.8): Size of geographical area of community affected by the hazard.	
Affected Area	**Score**
Isolated	1
Small	2
Medium	3
Large	4
Maximum Probable Extent (0.7): Anticipated damage to a typical facility/structure.	
Impact	**Score**
Negligible – less than 10% damage	1
Limited – between 10% and 25% damage	2
Critical – between 25% and 50% damage	3
Catastrophic – more than 50% damage	4
Secondary Impacts (0.5): Estimated secondary impacts to the community at large.	
Impact	**Score**
Negligible – no loss of function, downtime, and/or evacuations	1
Limited – minimal loss of function, downtime, and/or evacuations	2
Moderate – some loss of function, downtime, and/or evacuations	3
High – major loss of function, downtime, and/or evacuations	4
TOTAL SCORE = PROBABILITY X IMPACT, WHERE:	
Probability = (Probability Score x Importance)	
Impact = (Affected Area + Primary Impact + Secondary Impacts), where:	
Affected Area = Affected Area Score x Importance	
Primary Impact = Primary Impact Score x Importance	
Secondary Impacts = Secondary Impacts Score x Importance	

HAZARD PLANNING CONSIDERATION			
Score Range		***Value***	***Count***
0.0	12.0	Low	0
12.1	42.0	Medium	3
42.1	64.0	High	4

The probability of each hazard is determined by assigning a level, from unlikely to highly likely, based on the likelihood of occurrence from historical data. The total impact value includes the affected area, primary impact, and secondary impact levels of each hazard. Each level's score is reflected in the matrix. The total score for each hazard is the probability score multiplied by its importance factor times the sum of the impact level scores multiplied by their importance factors. Based on this total score, the hazards are separated into three categories based on the hazard level they pose to the communities: High, Medium, and Low.

Additionally, the categories of Extreme Weather and Human-Caused Hazards were reorganized to incorporate broader hazard considerations. As part of this reorganization, several previously listed hazards—Drought, Severe Weather (heat/rain/wind), Human-Caused Hazards (aircraft, civil disturbance, transportation accidents, terrorism, cyber), Hazardous Materials, and Disease/Pests—were consolidated within the updated hazard categories. This reorganization reflects stakeholder direction and a refined understanding of hazard relevance. This reclassification supports the elevation of Extreme Weather and Human-Caused Hazards from medium to high priority and ensures alignment with current risk profiles.

Table 4-3: Hazard Rankings identifies the final scores and the hazard planning consideration (threat level) for each hazard based on the discussions with the LHMP Planning Team and the prioritization process described above.

TABLE 4-3: HAZARD RANKINGS

HAZARD TYPE	PROBABILITY	IMPACT			TOTAL SCORE	HAZARD PLANNING CONSIDERATION
		Location	Primary Impact	Secondary Impacts		
Dam Failure	2.00	3.00	4.00	4.00	28.8	Medium
Flood	3.00	2.00	2.00	2.00	24.0	Medium
Extreme Weather Hazards	4.00	4.00	3.00	3.00	54.4	High
Geologic Hazards	3.00	2.00	2.00	3.00	27.0	Medium
Seismic Hazards	4.00	4.00	4.00	4.00	64.0	High
Wildfire and Urban Fire	4.00	3.00	4.00	3.00	53.6	High
Human-Caused Hazards	4.00	4.00	3.00	3.00	54.4	High

The LHMP Project Management Team ultimately identified four hazards including wildfire and urban fire, seismic hazards, human-caused hazards, and extreme weather hazards as high hazard planning considerations based on conversations with the LHMP Planning Team.

Many hazards identified by the LHMP Planning Team are recognized to be interconnected or interrelated. Where appropriate, the hazard profiles (presented below) may include references to other hazard profiles (such as including liquefaction within the seismic hazards hazard category).

Additionally, as part of the hazard identification and prioritization process, the LHMP Planning Team determined that some hazards could be combined for clarity purposes within a larger hazard category.

Some hazards were expanded or renamed to reflect conditions more accurately for the City of Fullerton. Thus, for example the Severe Weather profile includes drought, extreme heat, heavy rain, Santa Ana Winds, and power outage or utility failure as a secondary impact. It is noted that power outage or utility failure is not a direct hazard, but a secondary impact from other natural disasters (primarily Santa Ana Winds, but potentially extreme heat and heavy rains as well).

The Human-Caused Hazards profile includes aircraft/transportation incidents, hazardous materials spill, terrorism/cybersecurity, civil unrest/civil disturbance, and vector-borne disease and pandemic. The Seismic Hazards profile includes fault rupture, ground shaking and liquefaction. The Geologic Hazards profile includes landslide and land subsidence.

The following hazards are discussed within the 2024 LHMP, below:

- Dam Failure
- Flood
- Extreme Weather Hazards (Drought, Extreme Heat, Severe Winds/Santa Ana Winds, Heavy Rain, Power Outage/Utility Failure)
- Geologic Hazards (Landslide, Subsidence)
- Seismic Hazards (Fault Rupture, Ground Shaking, Liquefaction)
- Human-Caused Hazards (Aircraft/Transportation Incidents, Hazardous Materials Spill, Terrorism/Cybersecurity, Civil Unrest/Civil Disturbance, Vector-Borne Disease)
- Wildfire and Urban Fire

4.2 CLIMATE CHANGE CONSIDERATIONS

Climate change has the potential to exacerbate many of the existing hazards in the City. As such, the LHMP Team decided climate change would be included under each applicable hazard profile with a discussion about how each hazard would intersect or become more significant with impacts of climate change. Discussion and analysis related to climate change is discussed as a subsection under each hazard profile included below.

4.3 VULNERABILITY/RISK ASSESSMENT METHODOLOGY

Vulnerability describes asset susceptibility to damage and depends on a number of variables including the asset's construction, condition, contents, and economic value of functions. A vulnerability analysis predicts the extent of injury or damage on the built environment that may result from a hazard event of a given intensity in a specific area.

The vulnerability assessment considers risks to critical facilities and facilities of concern listed in Section 3.7, and to residential and non-residential buildings throughout Fullerton. Critical facilities and facilities of concern serve an important function in the operations of the municipal government and in serving the community. Critical facilities include essential public buildings, police and fire stations, transportation infrastructure, and essential public utility assets. Facilities of concern include schools, healthcare and assisted living facilities and community services. While the City owns and maintains many of the listed critical facilities, there are also critical facilities and facilities of concern owned by other public agencies or

jurisdictions. Direct and indirect impacts were considered as part of the vulnerability assessment as impacts to some facilities may have indirect impacts on other facilities or populations.

The vulnerability assessment below quantifies, to the extent feasible using the best available data, City assets at risk to hazards and estimates potential losses. This section focuses on the profiled hazards and risks specific to the City of Fullerton.

Each hazard profile in the following section includes a Vulnerability Assessment section that presents the results using the methodology described below. Replacement and content values for the facilities in each the hazard areas are tallied in each vulnerability table to estimate the total potential losses for each facility. The vulnerability assessment gives equal weight to all hazards, regardless of the identified probability. This assessment considers the physical threat to the critical facilities and facilities of concern, as well as the physical threat to residential and non-residential structures. The specific hazard and associated probability are considered as part of the mitigation prioritization, discussed in Section 5.0, Mitigation Strategy.

Socioeconomic impacts are generally discussed as some hazards have the potential to impact the City in ways beyond physical damages. To confirm at-risk community populations, a detailed parcel analysis investigated the intersection of each mapped natural hazard with development and population vulnerability. The critical facilities and facilities of concern listed in Section 3.7, Critical Facilities, were mapped in GIS and overlaid with mapped hazard areas (those hazards that have a specific or defined geographic area) to determine which assets are located in each hazard area.

Using the comprehensive parcel database from the City of Fullerton, parcels with residential and non-residential structures were identified within each mapped natural hazard zone. For residential assets, the number of units is reported per hazard zone. Zoning codes and density/intensity standards were used to estimate the number of units for residential uses. Single family homes are assumed to be one unit. The average density standard per zoning designation was used to estimate the number of units in some instances for parcels zoned for medium- and high-density land uses, where exact unit data was unavailable at a parcel basis. The number of residential units then informs an estimate of residents within each hazard zone. The estimate was generated using the average household size of 2.91 persons per household identified by the American Community Survey (ACS) 2023 dataset. For non-residential assets, the total structure square footage was calculated.

Hazard areas and critical facility overlays were conducted for: flood, landslide, liquefaction, and wildfire. It should be noted that the parcel analysis is based on the best available data and is intended for planning purposes only. The City of Fullerton provided parcel data via GIS files in September 2025. Michael Baker International did not manipulate the data and used the data as it was provided to estimate hazard vulnerabilities. As such, the parcel analysis serves as an estimate of potential losses based on this data snapshot and may not reflect actual or current conditions within the City at the time of LHMP approval.

Overlays were not prepared for the following hazards: dam failure, extreme weather hazards (drought, extreme heat, severe winds/Santa Ana winds, heavy rain, power outage/utility

failure), geologic hazards (subsidence), seismic hazards (fault rupture and ground shaking), human-caused hazards (aircraft/transportation incidents, hazardous materials spill, terrorism/cybersecurity, civil unrest/civil disturbance, vector-borne disease), and urban fire. These hazards are not geographically defined and/or have the potential to affect the entire City. For the purposes of this LHMP and vulnerability assessment, it is assumed that these hazards could impact the entirety of the planning area, including all critical facilities and facilities of concern.

Replacement and contents values for the facilities and the number of residents and residential and non-residential structures in each hazard area are provided where possible, to estimate the potential losses based on the method described above. Estimations were prepared using replacement values identified in the HAZUS 6.1 Inventory Technical Manual (2024), where appropriate and related land use categories are listed. Some critical facilities have unavailable replacement cost values due to ownership status or unique characteristics that make replacement estimates infeasible.

4.4 HAZARD PROFILES STRUCTURE AND DESCRIPTION

The following sections, Section 4.5 through Section 4.11, contain profiles for the hazards identified in **Table 4-1,** above. The profiles include a vulnerability analysis and risk assessment using the methods described in Section 4.3, *Vulnerability/Risk Assessment Methodology*. Each hazard profile is organized by the following subsections:

- **Description:** A brief introduction to the mechanisms behind the hazard.
- **Location/Extent**: An indication of geographic areas that are most likely to experience the hazard and a description of the potential magnitude and impacts of the hazard.
- **Previous Occurrences:** A highlight of recent and historical occurrences of the hazard accompanied by the impacts or damage to the planning area, if available.
- **Probability of Future Occurrences**: Discussion of the likelihood of the hazard occurring (or a timeframe of recurrence, if available).
- **Climate Change:** A discussion of how climate change may impact the location, magnitude, recurrence, or extent of the hazard into the future.
- **Vulnerability Assessment:** A description of the potential magnitude of losses associated with the hazard. Vulnerability may be expressed in quantitative or qualitative values depending upon available data. This section also discusses the changes in vulnerability due to expected growth and development within the planning area.
- **Changes in Vulnerability (Previous Five Years/Next Five Years):** A discussion of how changes in populations, development, and land use over the previous five years and projected changes over the next five years has impacted vulnerability to each hazard.
- **Limited Adaptive Capacity and AFN Populations:** A discussion of how the hazard may impact identified limited adaptive capacity and AFN populations within the planning area and considerations that have been incorporated into the mitigation strategy of this LHMP.

4.5 DAM FAILURE

4.5.1 DESCRIPTION

A dam is an artificial barrier preventing the flow of water or a barrier built across a watercourse for impounding water. Dam failure is the uncontrolled release of impounded water from behind a dam. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism can all cause dam infrastructure to fail. Dam failure causes downstream flooding of varying velocities that can result in loss of life and property.

Reservoirs are defined as an artificial lake, pond, impoundment, or tank, used to store water (both potable and non-potable). Reservoirs can be created on the surface by constructing dams to store water. Additionally, tank reservoirs can be constructed to store water above ground, on the surface, or below ground. Reservoir failure is the uncontrolled release of impounded water from a reservoir.

Dam or reservoir failures are most likely to happen for the following reasons:[1]

- Overtopping, caused by water spilling over the top of the dam, usually a precursor of dam failure because of inadequate spillway design, debris blockage of spillways, or settlement of the dam crest;
- Foundation defects, including settlement or slope stability;
- Cracking caused by natural settling of a dam or seismic movements;
- Inadequate maintenance and upkeep; and/or
- Piping, when seepage through a dam is not properly filtered, soil particles continue to progress and form sinkholes in the dam.

Because dam failure can have severe consequences, FEMA and Cal OES require all dam owners to develop an Emergency Action Plan (EAP) for warning, evacuation, and post-flood actions. In the event of a major dam failure, mutual aid from all levels of government would be required for an extended period. Recovery efforts would include the removal of debris, clearing roadways, demolishing unsafe structures, assistance in reestablishing public services, and providing continued care for the affected population.

Dams in Fullerton are either regulated by the California Department of Water Resources, Division of Safety of Dams (DSOD) or the United States Army Corps of Engineers (USACE), depending on the dam owner. DSOD ensures dam safety by:[2]

- Reviewing and approving dam enlargements, repairs, alterations, and removals, and ensuring that the dam appurtenant structures are designed to meet minimum requirements;

---

[1] Association of State Dam Safety Officials, *Dam Failures and Incidents*, https://damsafety.org/dam-failures, accessed September 3, 2025.

[2] California Department of Water Resources, *Division of Safety of Dams*, https://water.ca.gov/Programs/All-Programs/Division-of-Safety-of-Dams, accessed September 3, 2025.

- Performing independent analyses to understand dam and appurtenant structures performance (including structural, hydrologic, hydraulic, and geotechnical evaluations);
- Overseeing construction to ensure work is performed in accordance with approved plans/specifications;
- Inspecting each dam on an annual basis to ensure safety and performance standards; and,
- Periodically reviewing the stability of dams/major appurtenances, as well as new findings regarding earthquake hazards and hydrologic estimates in California.

DSOD is responsible for assigning each jurisdictional dam a downstream hazard classification. This classification is based only on potential downstream impacts to life and property, should the dam fail when operating with a full reservoir. This hazard status is not related to the condition of the dam or the likelihood of the dam to fail in either the short- or long-term. Additionally, dams in southern California usually do not operate at full capacity at all times of the year, and thus hazard risks and classifications are a worst-case scenario assessment. The DSOD definitions for downstream hazards are borrowed from the Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures and are outlined in **Table 4-4: DSOD Downstream Hazard Potential Classification Levels**.

TABLE 4-4: DSOD DOWNSTREAM HAZARD POTENTIAL CLASSIFICATION LEVELS

DOWNSTREAM HAZARD POTENTIAL CLASSIFICATION	POTENTIAL DOWNSTREAM IMPACTS TO LIFE AND PROPERTY
Low	No probable loss of human life and low economic and environmental losses. Losses are expected to be principally limited to the owner's property.
Significant	No probable loss of human life but can cause economic loss, environmental damage, impacts to critical facilities, or other significant impacts.
High	Expected to cause loss of at least one human life.
Extremely High	Expected to cause considerable loss of human life or would result in an inundation area with a population of 1,000 or more.

Source: California Department of Water Resources, Division of Safety of Dams, Dams within the Jurisdiction of the State of California, https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/Dams-Within-Jurisdiction-of-the-State-of-California-Listed-Alphabetically-by-Name-September-2022.pdf, published September 2022, accessed September 3, 2025.

DSOD inspects dams once annually and provides a condition assessment. This condition assessment is a more accurate tool to evaluate infrastructure risk. DSOD uses the National Inventory of Dams (NID) condition rating definitions, with additional criteria, as a guideline in assigning condition assessments. This rating system is outlined in **Table 4-5: DSOD Condition Assessment Rating Levels**.

TABLE 4-5: DSOD CONDITION ASSESSMENT RATING LEVELS

SAFETY RATING	NATIONAL INVENTORY OF DAMS DEFINITIONS	CALIFORNIA DSOD ADDITIONAL CRITERIA
Satisfactory	No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines.	None.
Fair	No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.	Dam has a long-standing deficiency that is not being addressed in a timely manner. Dam is not certified and its safety is under evaluation. Dam is restricted and operation of the reservoir at the lower level does not mitigate the deficiency.
Poor	A dam safety deficiency is recognized for loading conditions that may realistically occur. Remedial action is necessary. A poor rating may also be used when uncertainties exist as to critical analysis parameters that identify a potential dam safety deficiency. Further investigations and studies are necessary.	Dam has multiple deficiencies or a significant deficiency that require extensive remedial work.
Unsatisfactory	A dam safety deficiency is recognized that require immediate or emergency remedial action for problem resolution.	None.
Not Rated	The dam has not been inspected, is not under State jurisdiction, or has been inspected but, for whatever reason, has not been rated.	None.

Source: California Department of Water Resources, Division of Safety of Dams, Dams within the Jurisdiction of the State of California, https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/Dams-Within-Jurisdiction-of-the-State-of-California-Listed-Alphabetically-by-Name-September-2022.pdf, published September 2022, accessed September 3, 2025.

For dams owned and operated by the United States Army Corps of Engineers (USACE) the Dam Safety Action Classification System (DSAC) is used based on their inspections to determine the probability of failure and potential safety, economic and environmental risks. This rating system is outlined in **Table 4-6: USACE Dam Safety Action Classification System**.

TABLE 4-6: USACE DAM SAFETY ACTION CLASSIFICATION SYSTEM

SAFETY CLASS	SAFETY CHARACTERISTICS	DESCRIPTION
DSAC I (Urgent and Compelling)	Unsafe; Critically near failure or extreme high risk	Dams where progression toward failure is confirmed to be taking place under normal operations, and the dam is almost certain to fail under normal operations within a time frame from immediately to within a few years without intervention; or the combination of life or economic consequences with probability of failure is extremely high.
DSAC II (High Urgency)	Unsafe or Potentially Unsafe; Failure initiation foreseen or very high risk	Dams where failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety; or the combination of life or economic consequences with probability of failure is very high.
DSAC III (Moderate Urgency)	Conditionally Unsafe; Significantly inadequate or moderate to high risk	Dams that have issues where the dam is significantly inadequate, or the combination of life, economic or environmental consequences with probability of failure is moderate to high.
DSAC IV (Low Urgency)	Marginally Safe; Inadequate with low risk	Dams are inadequate with low risk such that the combination of life, economic or environmental consequences with a probability of failure is low, and the dam may not meet all essential USACE engineering guidelines.
DSAC V (Normal)	Adequately Safe; Residual risk considered tolerable	Dams considered adequately safe, meeting all essential agency guidelines, and the residual risk is considered tolerable.

Source: USACE, Dam Safety Program, https://www.usace.army.mil/Missions/Civil-Works/Dam-Safety-Program/Program-Activities/, accessed September 3, 2025.

Dam or reservoir failure within highly urbanized areas like the City can be catastrophic and result in property damage, destruction, and loss of life. Reservoirs in Orange County are regularly inspected and monitored to ensure structural integrity and safety; thus, most issues are identified early and immediately rectified to prevent dam failure. Dam failures can also increase in magnitude and severity when coupled with other natural disasters. Earthquakes or heavy rain can threaten the structural integrity of dam/reservoir infrastructure and create challenging conditions for emergency response.

4.5.2 LOCATION/EXTENT

Critical dams and reservoirs within and in proximity to the City of Fullerton, are listed in **Table 4-7: Dams and Reservoirs Within or Affecting City of Fullerton**. Dam inundation maps show areas downstream that would be inundated by water from an unintentional release of water from a dam's reservoir. There are five dams that have potential impact on the planning area; the

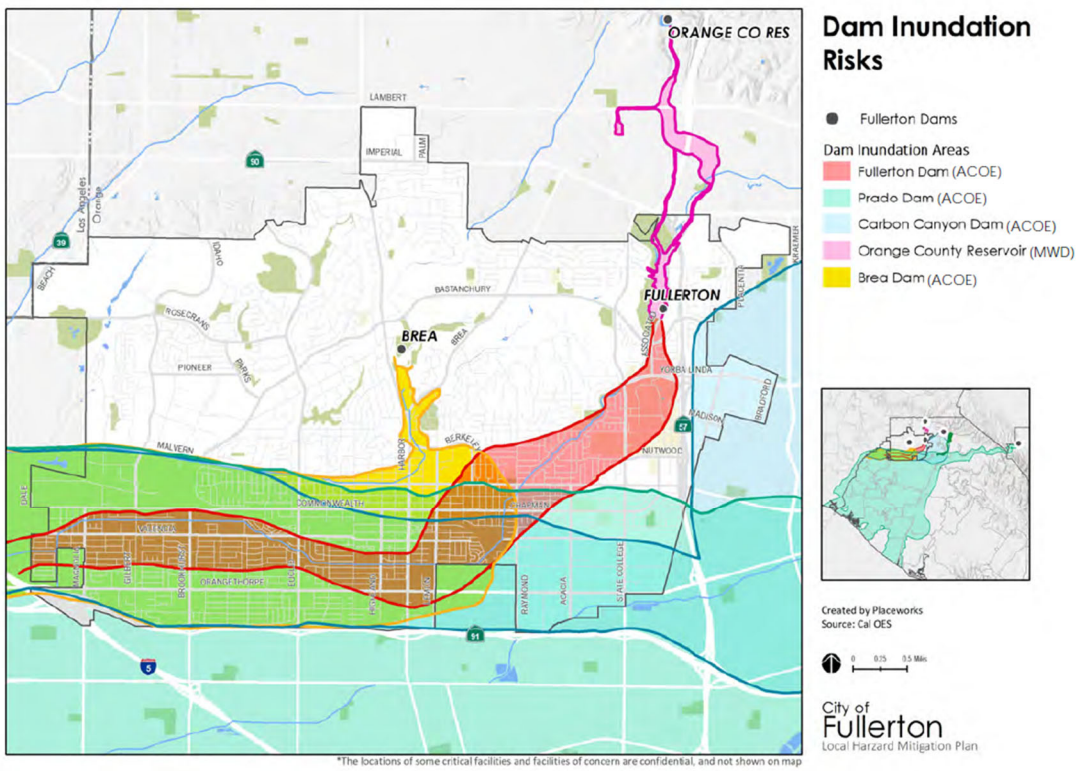
location of each dam and the extent of failure are described below, and shown in **Figure 4-1: Dam Inundation Map**.

TABLE 4-7: DAMS AND RESERVOIRS WITHIN OR AFFECTING THE CITY OF FULLERTON

DAM NAME	DAM OWNER	HAZARD CLASSIFICATION	TYPE	SIZE	DSOD CONDITION/ DSAC
Fullerton Dam	USACE	High	Earthen Embankment	1,342 acre-feet	DSAC V (Normal)
Prado Dam	USACE	High	Earthen Embankment	295,581 acre-feet	DSAC II (High Urgency)
Carbon Canyon Dam	USACE	High	Earthen Embankment	12,063 acre-feet	DSAC II (High Urgency)
Orange County Reservoir	Metropolitan Water District	Low	Earthen Embankment	217 acre-feet	Satisfactory
Brea Dam	USACE	High	Earthen Embankment	7,420 acre-feet	DSAC IV (Low Urgency)

Source: US Army Corps of Engineers, National Inventory of Dams, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.

FIGURE 4-1: DAM INUNDATION MAP



Fullerton Dam is owned and operated by the USACE and is located in the northeast portion of the City just west of State Route 57 and south of Craig Regional Park. The dam is an earthen embankment constructed in 1941. It has a maximum storage capacity of 1,342 acre-feet; however, because the dam is designed primarily for flood control, its reservoir is typically dry and only impounds water during significant storm events or the unlikely scenario of an upstream dam failure. Under the DSAC, Fullerton Dam is designated as DSAC V, indicating the dam is considered adequately safe with a normal priority for safety action.[3] Despite this classification, the dam carries a high downstream hazard potential. A high downstream hazard potential classification indicates that, in the event of a dam failure while operating at full capacity, the resulting inundation is expected to cause the loss of at least one human life. The downstream hazard potential is based solely on potential downstream impacts to life and property should these dams fail when operating with a full reservoir and is not an indication of structural integrity or probability of failure. Inundation from a dam failure would affect areas throughout the City of Fullerton, particularly along Fullerton Creek, including southern portions of the City and the downtown area. The extent of flooding would depend on the nature and severity of the failure. Because the dam is usually dry, the likelihood of such extensive inundation is low under normal operating conditions.

Prado Dam is owned and operated by the USACE and is located in San Bernardino County approximately 16 miles east of Fullerton along the Santa Ana River. The dam is an earth-filled embankment constructed in 1941 and has a maximum capacity of 295,581 acre-feet. The dam has been classified as DSAC II, which is described as high urgency of action.[4] Prado Dam is classified as having a high downstream hazard potential, meaning that a failure while operating at full capacity could result in loss of life and significant impacts to property. This classification reflects the potential consequences of such a failure and not the dam's structural condition or the likelihood of failure. The dam serves as a major flood control basin and is the primary regulating structure on the Santa Ana River; typically, Prado Dam is not impounding water at its maximum capacity. USACE has control measures to release water from the reservoir depending on the surface elevation of water behind the dam, however, there would potentially be significant impacts in the event of a dam failure at maximum capacity. Inundation would potentially impact a sizeable portion of the City. The inundation zone would also potentially inundate areas downstream and travel to the Pacific Ocean. The Prado Dam Emergency Action Plan, prepared in 2021, estimated that the population at risk could be 1.4 million for a maximum capacity failure scenario.[5]

Carbon Canyon Dam is owned and operated by USACE and is located within an unincorporated area of Orange County to the northeast of Fullerton. The dam is an earthen embankment constructed in 1961 by USACE as a flood control measure for the Carbon Canyon Creek drainage basin. The NID notes that Carbon Canyon Dam has a capacity of 12,063 acre-feet and

[3] US Army Corps of Engineers, *National Inventory of Dams*, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.
[4] US Army Corps of Engineers, *National Inventory of Dams*, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.
[5] US Army Corps of Engineers, *Flood Emergency Action Plan: Prado Dam*, December 2021.

is classified as DSAC II, which is described as high urgency.[6] Carbon Canyon Dam is classified as having a high downstream hazard potential, indicating that a failure at full reservoir capacity could result in loss of life and serious damage to downstream property. This designation is based solely on the potential consequences of such a failure and does not reflect the dam's structural integrity or the likelihood of failure. Inundation would potentially impact significant portions of the City, entering from the northeast and following Fullerton Creek throughout southern portions of the City. However, since the dam is primarily designed for flood control, its reservoir remains dry under normal conditions and only stores water during major storm events or in the rare event of an upstream dam failure.

Orange County Reservoir is owned and operated by the Metropolitan Water District and is located north of the City of Fullerton and just west of State Route 57. Constructed in 1941, this earthen embankment reservoir has a relatively small maximum storage capacity of 217 acre-feet. According to the DSOD, the reservoir has a Satisfactory condition assessment rating and is classified as having a low hazard potential.[7] In the event of a failure, inundation would primarily affect the northeastern portions of Fullerton, with flow potentially reaching Craig Regional Park and continuing downstream toward Fullerton Dam.

Brea Dam is owned and operated by USACE and is located near the center of the City of Fullerton. Constructed in 1942 as an earthen embankment, the dam serves primarily as a flood control facility. In addition to the main embankment, Brea Dam includes a saddle dike located approximately 0.8 miles north of the dam within the Fullerton Golf Course. A saddle dike is a secondary embankment constructed across a natural low point in the surrounding terrain. According to the NID, Brea Dam has a maximum storage capacity of 7,420 acre-feet and is classified as DSAC IV, indicating low urgency.[8] Despite this, the dam carries a high hazard potential classification due to the potential downstream impacts in the event of failure. A high downstream hazard potential classification means that failure at full reservoir capacity could result in loss of life and significant property damage. However, because the dam is designed primarily for flood control, its reservoir is typically dry and only impounds water during significant storm events or the unlikely scenario of an upstream dam failure. A failure event at full capacity would potentially affect central areas of Fullerton, particularly around Harbor Boulevard, downtown Fullerton, and southwestern portions of the City south of West Chapman Avenue and Malvern Avenue.

4.5.3 PREVIOUS OCCURRENCES

While California's dam infrastructure is relatively modern, the state has already experienced several significant dam-related incidents — including one in Fullerton itself. On February 22, 2005, following a period of intense winter rainfall, the Brea Dam reservoir exceeded its

[6] US Army Corps of Engineers, *National Inventory of Dams*, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.
[7] US Army Corps of Engineers, *National Inventory of Dams*, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.
[8] US Army Corps of Engineers, *National Inventory of Dams*, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.

capacity, resulting in water spilling over the dam's crest. The overflow caused localized flooding at the Fullerton Golf Course and along Bastanchury Road. Impacts included the closure of Bastanchury Road for one day, the golf course sustained damage, and an adjacent storm channel was eroded by the floodwaters. The event highlighted the importance of spillway capacity and stormwater management during extreme weather events.[9]

Additionally, a documented incident at Prado Dam occurred in January 2005, after an extended period of heavy precipitation, water began seeping through the dam infrastructure. After the seepage was detected, more than 2,000 residents in Riverside and Orange Counties were evacuated from downstream inundation zones. Flows were safely released into the Santa Ana River to relieve pressure on the dam and seepage was contained before authorities officially rescinded the voluntary evacuation the next day.[10] Failure risk of Prado Dam has been a recurring concern since the seepage in 2005. While this incident did not impact Fullerton, it serves as a reminder of potential threats from dam and reservoir infrastructure affecting the City.

California has also seen catastrophic dam failures with far-reaching consequences. One of the most devastating occurred in San Francisquito Canyon with the collapse of the St. Francis Dam on March 13, 1928. The disaster remains one of the worst engineering failures in U.S. history and led to major reforms in dam safety standards. Another notable failure occurred at the Baldwin Hills Dam in Los Angeles on December 14, 1963. A structural breach released approximately 250 million gallons of reservoir water. The Baldwin Hills Dam failure underscored the importance of real-time monitoring and emergency response planning in urban dam settings.

No federally declared disasters relating to dam or reservoir failure have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

4.5.4 PROBABILITY OF FUTURE OCCURRENCES

The likelihood of future dam failure events impacting the City of Fullerton is informed by both historical context and current dam safety assessments. While past incidents, such as the 2005 Brea Dam overflow and the Prado Dam seepage event, serve as reminders of potential vulnerabilities, the condition ratings of nearby dams provide a more current and technical basis for evaluating risk. Among the dams with potential to affect Fullerton, Prado Dam and Carbon Canyon Dam are both classified by the USACE as DSAC II, indicating a high urgency of action. In contrast, Brea Dam and Fullerton Dam are generally dry and carry lower classifications, DSAC IV and DSAC V, respectively. This suggests low to normal priority for safety action. The Orange County Reservoir, used for water storage, is rated as "Satisfactory" by the DSOD, indicating no known deficiencies.

---

[9] Rancho Santiago Community College District, *RSCCD Natural Hazard Mitigation Plan*, 2016.
[10] Los Angeles Times, 2,000 Near Dam Are Evacuated, https://www.latimes.com/archives/la-xpm-2005-jan-15-me-prado15-story.html, accessed September 3, 2025.

Based on these assessments, future dam failure is considered to have an occasional probability of directly impacting Fullerton. An occasional probability means a one to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years. Most nearby dams are either dry under normal conditions or have been evaluated as structurally sound or manageable under current safety protocols. However, the presence of high-priority dams like Prado and Carbon Canyon, combined with Fullerton's urbanized setting, means that any failure, however unlikely, could have significant consequences.

4.5.5 CLIMATE CHANGE

Climate change could indirectly increase the likelihood of dam/reservoir infrastructure failure. Increased severe storm events and flooding incidents could increase strain on dam/reservoir infrastructure, including dams within and upstream of the City. This is evidenced by the 2005 seepage incident at Prado Dam, triggered by unusually high repetitive rain events. Incidents such as this one could increase "wear and tear" and require additional maintenance and infrastructure improvements to protect dam integrity and function. Additionally, increased climate change-induced rains may cause more erosion which could compromise the structural integrity of the dam or the foundation it sits on. Severe storm events could also oversaturate soils and compromise dam infrastructure.

4.5.6 VULNERABILITY ASSESSMENT

At the time of LHMP development, detailed dam inundation maps illustrating flood depths, timing, or other data was not consistently available for all dams that could potentially impact the City of Fullerton. This is attributed to the mix of local and federal ownership of dam infrastructure. Therefore, this vulnerability assessment uses planning level data from the City of Fullerton General Plan and the previous LHMP that illustrates the extent of inundation only and does not provide detail related to flood depths or timing.

Significant overlap exists between dam failure and flood inundation areas in the City, resulting in shared areas of vulnerable assets. An inventory of these vulnerable assets is provided in **Table 4-8: Critical Facilities and Facilities of Concern Vulnerable to Dam Failure**, which outlines the specific facilities vulnerable to the dam failure hazard.

TABLE 4-8: CRITICAL FACILITIES AND FACILITIES OF CONCERN VULNERABLE TO DAM FAILURE

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
Critical Facilities			
1	City Hall	Municipal Government	$7,276,800
2	City Yard	Municipal Government	Not Available
4	Fire Station 2	Fire Station	$1,630,720
5	Fire Station 3	Fire Station	$1,630,720
7	Fire Station 5	Fire Station	$1,630,720
9	Police Station	Police Station	$8,534,160
10	Garnet Community Center	Community Center	$3,312,650

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
11	Maple Community Center	Community Center	$3,312,650
12	Richman Community Center	Community Center	$3,312,650
13	Main Library	Library	Not Available
14	Gilbert Community Center	Community Center	$3,312,650
15	Amerige Park	Park	Not Available
17	Fullerton Museum Center	Museum	$3,312,650
19	Fullerton Community Center	Community Center	$3,312,650
21	Independence Park	Park	Not Available
23	Fullerton Airport	Airport	$14,306,673
25	Bridge 55C0147	Bridge	Assumed $583/SF
26	Bridge 55C0290	Bridge	Assumed $583/SF
27	Bridge 55C0292	Bridge	Assumed $583/SF
28	Bridge 55C0288	Bridge	Assumed $583/SF
29	Bridge 55C0293	Bridge	Assumed $583/SF
30	Bridge 55C0291	Bridge	Assumed $583/SF
31	Bridge 55C0224	Bridge	Assumed $583/SF
32	Bridge 55C0228	Bridge	Assumed $583/SF
33	Bridge 55C0226	Bridge	Assumed $583/SF
34	Bridge 55C0225	Bridge	Assumed $583/SF
35	Bridge 55C0227	Bridge	Assumed $583/SF
36	Bridge 55C0229	Bridge	Assumed $583/SF
37	Bridge 55C0386	Bridge	Assumed $583/SF
38	Bridge 55C0230	Bridge	Assumed $583/SF
40	Bridge 55C0346	Bridge	Assumed $583/SF
41	Bridge 55C0289	Bridge	Assumed $583/SF
45	Bridge 55C0233	Bridge	Assumed $583/SF
46	Bridge 55C0231	Bridge	Assumed $583/SF
47	Bridge 55C0235	Bridge	Assumed $583/SF
48	Bridge 55C0294	Bridge	Assumed $583/SF
49	Bridge 55C0243	Bridge	Assumed $583/SF
50	Bridge 55C0242	Bridge	Assumed $583/SF
51	Bridge 55C0244	Bridge	Assumed $583/SF
52	Bridge 55C0234	Bridge	Assumed $583/SF
53	Bridge 55C0418	Bridge	Assumed $583/SF
54	Bridge 55C0703	Bridge	Assumed $583/SF
57	Bridge 55C0296	Bridge	Assumed $583/SF
61	Bridge 55C0384	Bridge	Assumed $583/SF
62	Bridge 55C0308	Bridge	Assumed $583/SF
63	Bridge 55C0236	Bridge	Assumed $583/SF
65	Bridge 55C0232	Bridge	Assumed $583/SF
66	Bridge 55C0263	Bridge	Assumed $583/SF
67	Bridge 55C0585	Bridge	Assumed $583/SF
68	Bridge 55C0310	Bridge	Assumed $583/SF
69	Bridge 55C0311	Bridge	Assumed $583/SF
70	Bridge 55C0312	Bridge	Assumed $583/SF
71	Bridge 55C0664	Bridge	Assumed $583/SF

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
72	Bridge 55C0383	Bridge	Assumed $583/SF
73	Bridge 55C0385	Bridge	Assumed $583/SF
74	Bridge 55C0309	Bridge	Assumed $583/SF
75	Bridge 55C0307	Bridge	Assumed $583/SF
76	Bridge 55C0295	Bridge	Assumed $583/SF
78	Bridge 55C0685	Bridge	Assumed $583/SF
96	Kimberly2 Pump Station (1)	Pump Station	$525,000
97	Kimberly2 Pump Station (2)	Pump Station	$525,000
98	Kimberly2 Pump Station (3)	Pump Station	$525,000
112	Main Plant Pump Station (1)	Pump Station	$525,000
113	Main Plant Pump Station (2)	Pump Station	$525,000
114	Main Plant Pump Station (3)	Pump Station	$525,000
115	Main Plant Pump Station (4)	Pump Station	$525,000
116	Main Plant Pump Station (5)	Pump Station	$525,000
117	Main Plant Reservoir	Reservoir	$1,500,000
134	Kimberly Well 1A PFAS Water Treatment Plant	Water Treatment Plant	$720,000,000
135	Main Plant Treatment	Water Treatment Plant	$720,000,000
Facilities of Concern			
1	Buena Park High School	Education	$72,097,328
2	Fullerton Union High School	Education	$57,867,998
4	La Sierra High School	Education	Not Available
5	La Vista High School	Education	Not Available
7	Sunny Hills High School	Education	$54,619,651
18	Maple Elementary School	Education	$8,418,496
19	Nicolas Junior High School	Education	$20,041,754
20	Orangethorpe Elementary School	Education	$16,034,073
21	Pacific Drive Elementary School	Education	$14,410,425
23	Raymond Elementary School	Education	Not Available
24	Richman Elementary School	Education	$19,184,566
27	Valencia Park Elementary School	Education	$16,754,018
28	Woodcrest Elementary School	Education	$16,095,256
33	Ruby Drive Elementary	Education	Not Available
35	Topaz Elementary School	Education	Not Available
36	Kids Adventure Learning Center	Education	Not Available
39	Arborland Montessori School - Valencia Campus	Education	Not Available
41	Ivycrest Montessori	Education	Not Available
42	Eastside Christian	Education	Not Available
44	James A. Whitaker Elementary	Education	$16,455,229
48	Acacia Villas Assisted Living	Medical	$6,536,250.00
55	D'Best Care Board and Care	Medical	$6,536,250.00
56	Senior Living Community	Medical	$6,536,250.00
57	Cherub Home	Medical	$6,536,250.00
59	Kindred Hospital Brea - Subacute	Medical	$6,536,250.00

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
60	Gordon Lane Convalescent Hospital	Medical	$6,536,250.00
67	Santa Ana Armory Cold Weather Shelter	Community Services	$6,536,250.00

In total, 70 critical facilities are located within the dam failure hazard zone. These include municipal buildings, police and fire stations essential for emergency response, community centers that may serve as emergency staging areas or gathering sites, transportation infrastructure such as bridges, and key water system utilities including pump stations and two water treatment plants. Additionally, 27 facilities of concern are potentially vulnerable, primarily consisting of schools and several healthcare and assisted living facilities that serve sensitive populations.

If any or all of these facilities were impacted by dam inundation, the consequences for the City of Fullerton would be severe. Damage to infrastructure and service providers would hinder emergency response, disrupt power and water delivery, and impair transportation networks, including major evacuation routes. The loss or impairment of these assets would significantly affect the City's ability to respond to the disaster and recover in its aftermath.

Based on population estimates utilized for the flood hazard vulnerability assessment, approximately 88,625 residents are estimated to be vulnerable to the dam failure hazard within the City of Fullerton. This estimate reflects the significant overlap between mapped flood inundation areas and potential dam failure inundation zones. While some dams have smaller inundation footprints that would affect fewer residents, this figure represents a conservative estimate of potential exposure. The LHMP Planning Team intentionally selected a conservative approach to ensure that vulnerability is not underestimated and that mitigation strategies adequately address populations most at risk.

In the event of dam failure, certain populations in the City of Fullerton would be particularly vulnerable to impacts, including older adults over the age of 65 and residents living in crowded households or multi-unit housing where evacuation and emergency response may be more challenging. These populations may face increased challenges related to evacuation, mobility, access to information, and recovery following a disaster. Older adults may also be more susceptible to health complications during emergencies, while residents in dense housing environments may experience compounding impacts due to shared infrastructure and limited egress options.

4.5.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Since the previously prepared 2020 LHMP, the City of Fullerton has experienced minimal changes in population and land use. The population increased by less than one percent, and development activity was largely limited to residential infill, mixed-use redevelopment, and rehabilitation of existing structures. While the total number of housing units grew by approximately 4.2 percent, this modest increase in residential density suggests only a marginal rise in vulnerability to dam and reservoir failure. Given the assumption that the entire city is potentially vulnerable to dam inundation, any new development over the past five years,

regardless of location, represents a slight increase in exposure. However, the overall stability in population patterns and land use over the past five years indicates that changes in vulnerability have been minimal.

Looking ahead, Fullerton is expected to accommodate significant residential growth, driven by its obligation to meet the Regional Housing Need Allocation (RHNA) target of 13,209 units by 2029. The City's strategy to meet this goal includes infill development, adaptive reuse, and zoning flexibility, particularly through the Housing Incentive Overlay Zone (HIOZ), which spans 759 parcels across various corridors. These efforts will likely result in increased residential density and redevelopment throughout the city. Additionally, a diverse mix of development projects including multi-family housing, student accommodations, industrial expansion, and commercial revitalization will reshape the urban landscape. Upcoming development projects, combined with anticipated infrastructure improvements, suggest a moderate increase in exposure to dam and reservoir failure over the next five years.

While past development trends have resulted in only marginal increases in exposure, future growth, particularly in residential density and mixed-use redevelopment, will likely elevate the City's overall vulnerability.

4.5.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area, including census tracts with concentrations of individuals with AFN or limited adaptive capacity. Dam failure poses a significant risk to portions of the City of Fullerton, with particular concentration in the south and southwestern regions of the City. Notably, mapped dam inundation zones overlap with census tracts formally designated as areas with limited adaptive capacity and AFN populations, including Census Tracts 001801, 001802, 001902, 011601, 011602, 011403, 011502, 011504, and 011711. These tracts are known to have high concentrations of older adults, individuals with disabilities, linguistically isolated households, and residents in crowded households, multi-unit housing, or persons living in group quarters.

The primary concern for those with AFN is evacuations and access to resources and emergency services in the event of dam failure. People aged 65 and older may have mobility issues, disabilities, or chronic health conditions that complicate evacuation and access to emergency services. Disabled patients in congregate care, assisted living facilities, or similar patient care environments are particularly vulnerable to the effects of dam failure. Limited mobility and dependence on caregivers make evacuation extremely challenging when faced with sudden emergencies like dam inundation. Populations with linguistic isolation may face challenges with emergency instructions, and communication barriers may prevent them from receiving or understanding emergency alerts. Households in multi-unit housing crowded households, and persons in group quarters may lack financial resources, making it difficult to secure transportation and temporary housing during evacuations. Further, these groups might face overcrowding and limited escape routes, increasing the risk during evacuations.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation Actions #1, 3, 11 and 18 with these groups in mind, efforts to educate and inform them of available resources to prepare for and respond to hazard events.

4.6 FLOOD

4.6.1 DESCRIPTION

Flooding occurs when a waterway (either natural or artificial drainage channel) receives more water than capable of conveying, causing the water level in the waterway to rise. Depending on how long these conditions last and the amount of runoff the waterway receives in proportion to its capacity, the rising water level may eventually overtop the waterway's banks or any other boundaries to the drainage area, resulting in flooding.

Floods often occur during heavy precipitation events, when the amount of rainwater exceeds the capacity of storm drains or flood control channels. Floods can also happen when infrastructure such as levees, dams, or culverts fail, or when a section of drainage infrastructure fails, and water cannot be drained from an area quickly enough. These failures can be linked to precipitation events (i.e., when water erodes away a levee, allowing water to escape and flood nearby areas), or can be a consequence of other emergency situations (i.e., a dam collapsing due to an earthquake). FEMA defines flood or flooding as a general and temporary condition of partial or complete inundation of normally dry land areas from:[11]

- The overflow of inland or tidal waters;
- The unusual and rapid accumulation or runoff of surface waters from any source; or,
- Mudslides (i.e., mudflows) which are proximately caused by flooding and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current; or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Floods can be caused by a number of factors, including:

- Weather and climate patterns (e.g., El Niño, La Niña, Pineapple Express, Atmospheric River, etc.)
    - El Niño and La Niña are complex weather patterns resulting from variations in ocean temperatures in the equatorial Pacific. Warmer or colder than average ocean temperatures in one part of the world can influence weather around the globe. El Niño and La Niña episodes typically last 9 to 12 months, but some prolonged events may last for years.[12]

[11] FEMA, *Glossary: Flood*, https://www.fema.gov/about/glossary/b, accessed September 4, 2025.
[12] NOAA, *What are El Nino and La Nina?,* https://oceanservice.noaa.gov/facts/ninonina.html, accessed September 4, 2025.

    - Pineapple Express is a name given to an atmospheric river on the West Coast. It is a channel in the atmosphere that moves vast amounts of moisture and can result in massive rain showers.
- Hydrologic features such as reservoirs, ponds, lakes, rivers, etc., can have a large impact on the amount of flooding.
- The absorption capacity of the ground depends on the composition of soil and bedrock of the area. Less absorbent soil conditions in addition to lack of proper storm infrastructure can result in flooding.
- Type and density of vegetation is related to moisture absorption affecting the flow of water.
- Patterns of land use/urbanization relates to the pervious and impervious nature of the ground.
- Expected level, age, and condition of flood management infrastructure can impact flooding conditions.
- Large-scale wildfires dramatically alter the terrain and ground conditions. Vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to properly absorb water, creating conditions ripe for flash flooding and debris flow. Flood risk remains significantly higher until vegetation is restored – up to five years after a wildfire.[13]

The force of flood can be enough to carry away large objects and damage structures, causing considerable damage to buildings and infrastructure. In severe instances, floodwaters themselves can destroy structures or move structures off foundations. Floods can saturate and weaken the soil, potentially making structures or infrastructure more susceptible to damage or collapse. Flooding can also affect water quality, as large volumes of water can transport contaminants into water bodies and overload storm/wastewater systems. Additionally, large increases in water volume can cause water body erosion and loss of aquatic habitat. Flood events may be particularly destructive when they create conditions conducive to geologic hazards including landslides or debris flows.

4.6.2 LOCATION/EXTENT

The City of Fullerton is located in the Coyote Creek Watershed, the northernmost watershed in Orange County.[14] This watershed ultimately flows into Coyote Creek, the San Gabriel River and then the Pacific Ocean. Locally, the City is traversed by Fullerton Creek and Brea Creek, which flow southwest from Chino Hills and serve as primary drainage pathways during storm events.

---

[13] FEMA, *Flood Risk Increases After Fires Are Out – Buy Flood Insurance Now*, https://www.fema.gov/fact-sheet/4562/flood-risk-increases-after-fires-are-out-buy-flood-insurance-now, published October 21, 2020, accessed September 4, 2025.

[14] Orange County Public Works, *Orange County GIS Open Data Portal: Our Watersheds*, https://data-ocpw.opendata.arcgis.com/maps/OCPW::orange-county-our-watersheds/explore?location=33.766961%2C-117.759619%2C11.14, accessed September 5, 2025.

Flood zones in Fullerton are determined by Flood Insurance Rate Maps (FIRMs). FIRMs are produced by FEMA and shows flood hazard areas. These may include high-hazard areas, moderate- to low-hazard areas, and undetermined areas. A high-hazard area is identified as a special flood hazard area (SFHA) denoting the 100-year floodplain (Zone A, AE, AO, AH, VE, V). A FIRM map also includes the 500-year floodplain (Zone X), classified as moderate and minimal risk areas. A 100-year flood event has a 1 in 100 chance (1 percent) of occurring in any given year; a 500-year flood event has a 1 in 500 chance (0.2 percent). This data is incorporated into FIRMs to support the National Flood Insurance Program (NFIP) and provide the basis for community floodplain management regulations and flood insurance requirements. **Table 4-9: Flood Zone Definitions** identifies each flood zone type within the City.

TABLE 4-9: FLOOD ZONE DEFINITIONS

FLOOD ZONE	RISK
(SFHA) Floodplain – 100-year flood zone (AO)	1% annual flood risk
500-year flood zone (X)	0.2% annual flood risk
Area of minimal flood hazard	Minimal flood risk

Source: FEMA, FEMA Flood Maps and Zones Explained, https://www.fema.gov/blog/fema-flood-maps-and-zones-explained, accessed September 5, 2025.

Figure 4-2: FEMA Flood Zones identifies the flood hazard areas within the City. In Fullerton the 100-year floodplain is not a contiguous area but consists instead of various pockets across the City. Primarily these include a residential area northeast of the intersection of I-5 and SR-91, a portion of land that follows the Union Pacific Railway abutting Bastanchury Road between Parks Road and W Malvern Avenue, and other small pockets throughout the City. In contrast, the 500-year floodplain covers a large section of Fullerton. Most of the City south of Malvern Avenue and Chapman Avenue, a multifamily neighborhood across SR-57 from California State University, Fullerton (CSUF), and sections of Harbor Boulevard south of the Brea Dam are included in the 500-year floodplain category.

Localized flooding can occur outside of mapped flood hazard zones, especially during heavy rain events. Localized flooding typically occurs when significant amounts of rain fall over a short time period and/or, as a result of overloaded or blocked stormwater drainage systems, cause sheet flow into streets and low-lying areas. Localized flooding has been noted to occur in the following areas:

- The intersection of Orangethorpe Ave. and Raymond Ave,
- The length of Commonwealth Ave. from S. Richman Ave. to Euclid St.
- The length of Brookhurst Road between Orangethorpe Ave. and SR-91
- The intersection of N. Yale Ave. and E. Brookdale Pl.
- The length of Dorothy Ln. between Raymond Ave. and Acacia Ave.
- The length of N. Arroyo Pl. to the extent that it is unusable for evacuations
- The length of Julie Ave.

The extent or magnitude of flooding is measured by percentage and annual chance floods. The flooding areas are classified as 1 in 100 (one percent) or high risk, and 1 in 500 (0.2 percent) or moderate risk of flooding. Areas having a chance of less than 0.2 percent are classified as low risk areas. Floods are measured by stream gages that are installed in bodies of water near populated areas. They are installed and operated by the United States Geological Survey (USGS) and continuously monitor water levels.

4.6.3 PREVIOUS OCCURRENCES

The City of Fullerton has experienced multiple significant flood events throughout its history, particularly in the early to mid-20th century. According to historical accounts and regional flood control documentation, Fullerton was notably impacted by floods throughout the nineteenth and twentieth centuries.

Between December 1861 to January 1862, a 30-day-long period of rain called the "Noachian Deluge of California" poured across all of California. The Santa Ana River overflowed and spread across all of the low-lying areas of Orange County between Anaheim and the Coyote Hills (present-day Fullerton) in a four-foot-deep sea. Twenty deaths were recorded in Orange County alone.[15] In 1900 and 1916, intense rainfall overwhelmed natural drainage systems, prompting the eventual formation of the Orange County Flood Control District in 1927 to address recurring flood risks.[16]

The 1938 flood, one of Southern California's most catastrophic weather events, severely affected Fullerton and surrounding areas. Between February 27 and March 4, approximately 5.16 inches of rainfall fell over 36 hours, causing widespread flooding throughout the Santa Ana River watershed. Fullerton experienced inundation along Brea Creek, which overflowed and led to significant property damage. In response, the Works Progress Administration (WPA) constructed the Brea Creek Channel in 1940, followed by the Brea Dam and Fullerton Dam in 1941, as part of a regional flood control effort led by the U.S. Army Corps of Engineers.[17] In February 1969, a 100-year storm event brought over 7 inches of rainfall to Orange County. Thanks to the flood control infrastructure developed after the 1938 disaster, including dams, channels, and storm drain, Fullerton was largely protected from the severe impacts experienced in earlier decades. Reports credit the system with preventing over $1.5 billion in damages across the region.

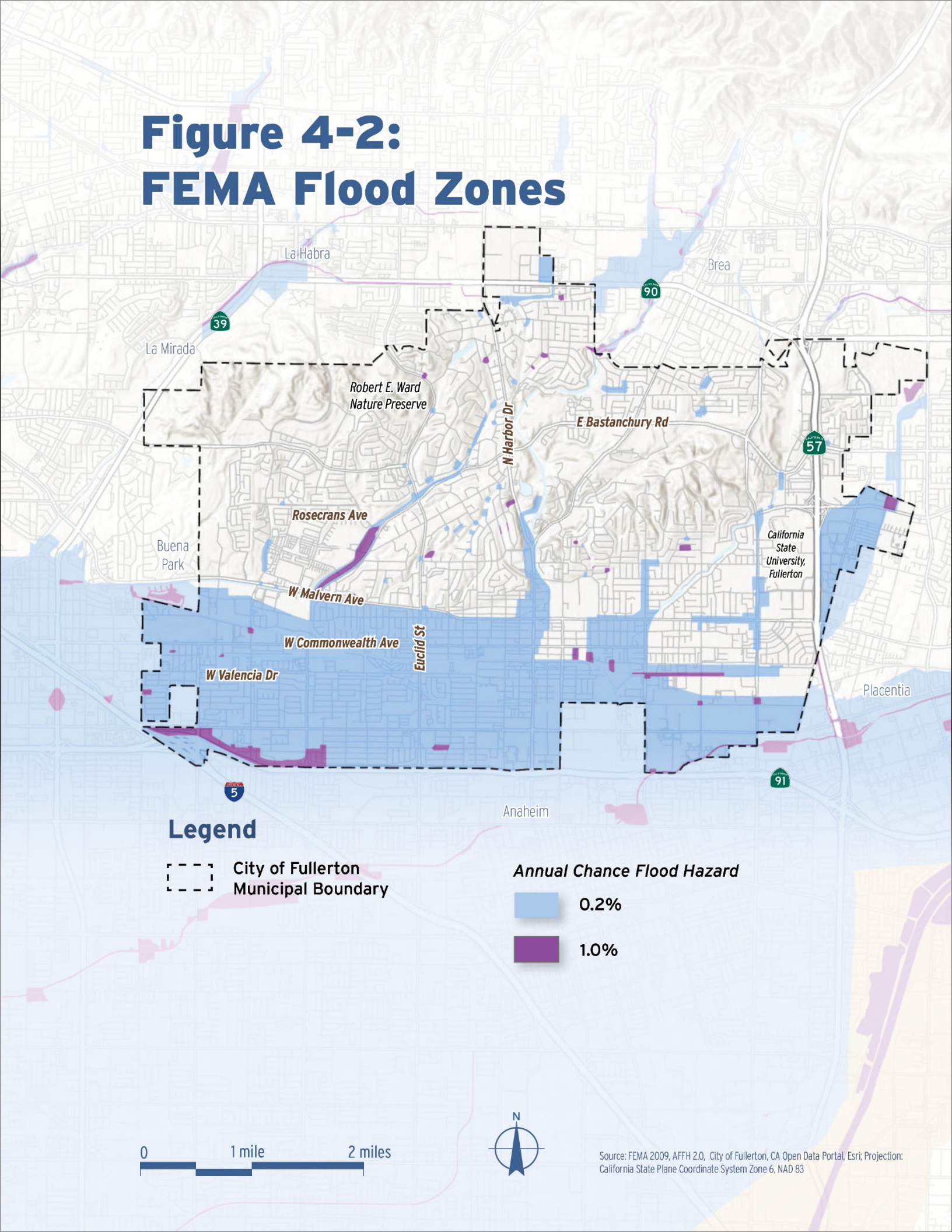
---

[15] NOAA National Weather Service, *A History of Significant Weather Events in Southern California*, https://www.weather.gov/media/sgx/documents/weatherhistory.pdf, updated March, 2025, accessed September 5, 2025.

[16] Living New Deal, *Brea Creek Flood Control Project – Fullerton CA*, https://livingnewdeal.org/sites/brea-creek-flood-control-project-fullerton-ca/, accessed September 5, 2025.

[17] Living New Deal, *Brea Creek Flood Control Project – Fullerton CA*, https://livingnewdeal.org/sites/brea-creek-flood-control-project-fullerton-ca/, accessed September 5, 2025.

Figure 4-2: FEMA Flood Zones



Source: FEMA 2009, AFFH 2.0, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

More recently, Fullerton has experienced several impactful flood events tied to atmospheric river storms and tropical systems. In December 2021, a series of winter storms swept through Southern California, triggering flash flood warnings and mandatory evacuations in parts of Orange County. While Fullerton was spared from severe damage, nearby areas experienced mudslides and debris flows due to saturated soils and burn scars from previous wildfires.

During late February and March 2023, Southern California was hit by a series of powerful winter storms, including multiple atmospheric rivers and bomb cyclones. These systems brought record-breaking rainfall and above-average precipitation across the region, with Orange County experiencing widespread urban flooding. Though not heavily featured in statewide damage reports, Fullerton experienced localized street flooding, particularly in low-lying zones and areas with older drainage infrastructure.

On August 20, 2023, Tropical Storm Hilary brought record-breaking rainfall to Southern California, marking the first tropical storm to hit the region in over 80 years. In Orange County, rainfall totals ranged from 1.5 to over 3 inches, with inland cities like Fullerton likely receiving around 2 inches during the peak of the storm. According to Orange County Public Works, there were no significant issues along flood control channels or major roadways, though crews responded to localized flooding and blocked drains, including in residential neighborhoods.[18] Fullerton was not specifically named in damage reports.

In February 2024, a series of powerful winter storms led to widespread urban flooding across Orange County. Fueled by back-to-back atmospheric rivers, the storms brought record-breaking rainfall, damaging winds, and flash flood warnings throughout Southern California. Orange County was placed under a state of emergency due to the magnitude of the impacts.[19]

In the last five years, two FEMA-declared disasters and five state declared disasters for flood or winter storms have affected the planning area:

- EM-3591-CA: Severe Winter Storms, Flooding, and Mudslides – January 8, 2023
- EM-3592-CA: Severe Winter Storms, Flooding, Landslides, and Mudslides – March 9, 2023
- State Disaster 146: Severe Winter Storms – February 2024
- State Disaster 142: Tropical Storm Hilary – August 2023
- State Disaster 141: Severe Winter Storms – February 2023 - March 2023
- State Disaster 140: Severe Winter Storms – December 2022 - January 2023
- State Disaster 127: Severe Winter Storms – December 2021

---

[18] Patch News, *Orange County Rain Totals From Tropical Storm Hilary: Cleanup Ensues*, https://patch.com/california/orange-county/orange-county-rain-totals-tropical-storm-hilary-cleanup-ensues, accessed September 17, 2025.

[19] California Governor's Office, *Proclamation of a State of Emergency: February Winter Storms*, https://www.gov.ca.gov/wp-content/uploads/2024/02/2024-2-4.Feb-Winter-Storms-SOE-Proc.pdf, accessed September 18, 2025.

Refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area** for a full list of federally declared disasters affecting the planning area.

4.6.4 PROBABILITY OF FUTURE OCCURRENCES

Based on the frequency of severe weather events and the capacity of existing facilities, there is a likely probability of a flood occurring in Fullerton. A likely probability means a 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years. The majority of the City is outside of any designated flood hazard zone, where a flood is not likely to occur. For areas located within the 100-year flood zone, the probability of flood is a one percent chance in a given year that this area will be inundated by flood waters. For moderate flood hazard areas located within the 500-year flood zone, the probability decreases to 0.2 percent chance in a given year that the area will be inundated by flood water. Minimal flood hazard areas exist beyond the 0.2 percent annual chance for a flood zone.

Additionally, since historic flooding in the area, there have been significant regional drainage infrastructure improvements including channelization, flood control dams/reservoirs, and debris basins to prevent Orange County from subsequent flooding. The construction of Prado Dam, Fullerton Dam, and Brea Dam in the 1940's continue to mitigate flood risk in the areas within and in proximity to the City of Fullerton.

4.6.5 CLIMATE CHANGE

Climate change is likely to have a direct effect on flooding. According to research conducted by the University of California, Los Angeles, California will experience extremely wet and extremely dry seasons by the end of the century. It is predicted that "over the next 40 years, the State will be 300 to 400 percent more likely to have a prolonged storm sequence as severe as the one that caused the legendary California flood more than 150 years ago."[20]

This research team confirmed the recent findings from a New York Times article titled "The Coming California Megastorm," predicting a future superstorm exacerbated by climate change. A warmer climate can carry atmospheric rivers in rapid succession to California, testing the capacity of dams and flood control infrastructure. The risk of a month-long megastorm as modeled and visualized by this article has a one in 50 chance of occurring annually. If global temperatures continue to climb, the likelihood of such a storm could increase to one in 30.[21] Thus, flood considerations should continue to remain a mitigation priority into the future.

---

[20] UCLA Newsroom, *Study forecasts a severe climate future for California*, https://newsroom.ucla.edu/releases/california-extreme-climate-future-ucla-study, accessed September 5, 2025.

[21] New York Times, *The Coming California Megastorm*, https://www.nytimes.com/interactive/2022/08/12/climate/california-rain-storm.html, published August 12, 2022, accessed September 5, 2025.

4.6.6 VULNERABILITY ASSESSMENT

To identify populations at risk for flood hazards, hazard data layers from FEMA were overlaid and compared with City parcel data in Geographic Information Systems, ArcGIS. If a hazard layer either completely or partially overlapped with a parcel in the data layer, then the entire parcel is conservatively considered vulnerable in this analysis. In some instances, the flood hazard zones intersected with only small portions of individual properties. However, to provide a detailed understanding of risk and vulnerability as part of this hazard mitigation plan, these parcels (including all residential and non-residential development on the parcel, regardless of location) are considered vulnerable.

Flooding poses a significant risk to portions of the City of Fullerton, particularly within designated 100-year and 500-year flood zones, which are distributed throughout the City with notable concentrations in the southwestern region. These mapped flood zones indicate that a range of critical facilities and facilities of concern are potentially vulnerable to flood impacts. An inventory of these vulnerable assets is provided in **Table 4-10: Critical Facilities and Facilities of Concern Vulnerable to Flood**, which outlines the specific facilities located within the flood hazard zones.

TABLE 4-10: CRITICAL FACILITIES AND FACILITIES OF CONCERN VULNERABLE TO FLOOD

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
Critical Facilities			
1	City Hall	Municipal Government	$7,276,800
2	City Yard	Municipal Government	Not Available
4	Fire Station 2	Fire Station	$1,630,720
5	Fire Station 3	Fire Station	$1,630,720
7	Fire Station 5	Fire Station	$1,630,720
9	Police Station	Police Station	$8,534,160
10	Garnet Community Center	Community Center	$3,312,650
11	Maple Community Center	Community Center	$3,312,650
12	Richman Community Center	Community Center	$3,312,650
13	Main Library	Library	Not Available
14	Gilbert Community Center	Community Center	$3,312,650
15	Amerige Park	Park	Not Available
17	Fullerton Museum Center	Museum	$3,312,650
19	Fullerton Community Center	Community Center	$3,312,650
21	Independence Park	Park	Not Available
23	Fullerton Airport	Airport	$14,306,673
25	Bridge 55C0147	Bridge	Assumed $583/SF
26	Bridge 55C0290	Bridge	Assumed $583/SF
27	Bridge 55C0292	Bridge	Assumed $583/SF
28	Bridge 55C0288	Bridge	Assumed $583/SF
29	Bridge 55C0293	Bridge	Assumed $583/SF
30	Bridge 55C0291	Bridge	Assumed $583/SF

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
31	Bridge 55C0224	Bridge	Assumed $583/SF
32	Bridge 55C0228	Bridge	Assumed $583/SF
33	Bridge 55C0226	Bridge	Assumed $583/SF
34	Bridge 55C0225	Bridge	Assumed $583/SF
35	Bridge 55C0227	Bridge	Assumed $583/SF
36	Bridge 55C0229	Bridge	Assumed $583/SF
37	Bridge 55C0386	Bridge	Assumed $583/SF
38	Bridge 55C0230	Bridge	Assumed $583/SF
40	Bridge 55C0346	Bridge	Assumed $583/SF
41	Bridge 55C0289	Bridge	Assumed $583/SF
45	Bridge 55C0233	Bridge	Assumed $583/SF
46	Bridge 55C0231	Bridge	Assumed $583/SF
47	Bridge 55C0235	Bridge	Assumed $583/SF
48	Bridge 55C0294	Bridge	Assumed $583/SF
49	Bridge 55C0243	Bridge	Assumed $583/SF
50	Bridge 55C0242	Bridge	Assumed $583/SF
51	Bridge 55C0244	Bridge	Assumed $583/SF
52	Bridge 55C0234	Bridge	Assumed $583/SF
53	Bridge 55C0418	Bridge	Assumed $583/SF
54	Bridge 55C0703	Bridge	Assumed $583/SF
57	Bridge 55C0296	Bridge	Assumed $583/SF
61	Bridge 55C0384	Bridge	Assumed $583/SF
62	Bridge 55C0308	Bridge	Assumed $583/SF
63	Bridge 55C0236	Bridge	Assumed $583/SF
65	Bridge 55C0232	Bridge	Assumed $583/SF
66	Bridge 55C0263	Bridge	Assumed $583/SF
67	Bridge 55C0585	Bridge	Assumed $583/SF
68	Bridge 55C0310	Bridge	Assumed $583/SF
69	Bridge 55C0311	Bridge	Assumed $583/SF
70	Bridge 55C0312	Bridge	Assumed $583/SF
71	Bridge 55C0664	Bridge	Assumed $583/SF
72	Bridge 55C0383	Bridge	Assumed $583/SF
73	Bridge 55C0385	Bridge	Assumed $583/SF
74	Bridge 55C0309	Bridge	Assumed $583/SF
75	Bridge 55C0307	Bridge	Assumed $583/SF
76	Bridge 55C0295	Bridge	Assumed $583/SF
78	Bridge 55C0685	Bridge	Assumed $583/SF
96	Kimberly2 Pump Station (1)	Pump Station	$525,000
97	Kimberly2 Pump Station (2)	Pump Station	$525,000
98	Kimberly2 Pump Station (3)	Pump Station	$525,000
112	Main Plant Pump Station (1)	Pump Station	$525,000
113	Main Plant Pump Station (2)	Pump Station	$525,000
114	Main Plant Pump Station (3)	Pump Station	$525,000
115	Main Plant Pump Station (4)	Pump Station	$525,000
116	Main Plant Pump Station (5)	Pump Station	$525,000
117	Main Plant Reservoir	Reservoir	$1,500,000

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
134	Kimberly Well 1A PFAS Water Treatment Plant	Water Treatment Plant	$720,000,000
135	Main Plant Treatment	Water Treatment Plant	$720,000,000
Facilities of Concern			
1	Buena Park High School	Education	$72,097,328
2	Fullerton Union High School	Education	$57,867,998
4	La Sierra High School	Education	Not Available
5	La Vista High School	Education	Not Available
7	Sunny Hills High School	Education	$54,619,651
18	Maple Elementary School	Education	$8,418,496
19	Nicolas Junior High School	Education	$20,041,754
20	Orangethorpe Elementary School	Education	$16,034,073
21	Pacific Drive Elementary School	Education	$14,410,425
23	Raymond Elementary School	Education	Not Available
24	Richman Elementary School	Education	$19,184,566
27	Valencia Park Elementary School	Education	$16,754,018
28	Woodcrest Elementary School	Education	$16,095,256
33	Ruby Drive Elementary	Education	Not Available
35	Topaz Elementary School	Education	Not Available
36	Kids Adventure Learning Center	Education	Not Available
39	Arborland Montessori School - Valencia Campus	Education	Not Available
41	Ivycrest Montessori	Education	Not Available
42	Eastside Christian	Education	Not Available
44	James A. Whitaker Elementary	Education	$16,455,229
48	Acacia Villas Assisted Living	Medical	$6,536,250.00
55	D'Best Care Board and Care	Medical	$6,536,250.00
56	Senior Living Community	Medical	$6,536,250.00
57	Cherub Home	Medical	$6,536,250.00
59	Kindred Hospital Brea - Subacute	Medical	$6,536,250.00
60	Gordon Lane Convalescent Hospital	Medical	$6,536,250.00
67	Santa Ana Armory Cold Weather Shelter	Community Services	$6,536,250.00

In total, 70 critical facilities are located within the flood hazard zones. These include municipal buildings, police and fire stations essential for emergency response, community centers that may serve as emergency staging areas or gathering sites, transportation infrastructure such as bridges, and key water system utilities including pump stations and two water treatment plants. Additionally, 27 facilities of concern are potentially vulnerable, primarily consisting of schools and several healthcare and assisted living facilities that serve sensitive populations.

Flooding in these areas could disrupt emergency services, damage infrastructure, impair transportation routes, and compromise water system operations. The presence of critical and sensitive facilities within flood-prone zones underscores the importance of targeted mitigation

strategies and emergency preparedness planning to reduce potential impacts and enhance community resilience.

Additionally, approximately 914 residential units are located within the 100-year flood zone (1.0 percent annual chance of flood), and 29,541 residential units are located within the 500-year flood zone (0.2 percent annual chance of flood). The vulnerability assessment cross-referenced hazard layers with parcel data layers in GIS. The number of vulnerable residential units multiplied by the average of 2.91 persons per household for Fullerton indicates that approximately 2,660 people reside in the 100-year flood zone and approximately 85,965 residents reside in the 500-year flood zone. Additionally, approximately 16,296,271 square feet and 282,620,699 square feet of non-residential structures are located within the 100- and 500-year flood zones respectively. Refer to **Table 4-11: Populations at Risk for Flood** for a summary of vulnerable residents, residential units, and non-residential buildings.

TABLE 4-11: POPULATIONS AT RISK FOR FLOOD

RESIDENTS AT RISK	RESIDENTIAL UNITS AT RISK	NON-RESIDENTIAL AREA AT RISK (SQ.FT.)
100-Year Flood (1% Chance Flood Zone)		
2,660 residents	914 residential units	16,296,271 sq. ft.
500-Year Flood (0.2% Chance Flood Zone)		
85,965 residents	29,541 residential units	282,620,699 sq. ft.

Flooding could directly impact the City of Fullerton and cause secondary impacts leading to displacement of residents and the destruction of homes and businesses. The economic impact would include significant losses in property value, local businesses, commercial industries, and tourism. Overall, the potential social, economic, and environmental consequences of flooding in the city could be far-reaching and may require investment in mitigation and adaptation strategies.

4.6.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Since the previously prepared 2020 LHMP, the City of Fullerton has experienced marginal population growth and moderate increases in housing development, primarily through residential infill, mixed-use redevelopment, and rehabilitation of existing structures. While development was not concentrated in flood-prone areas, it is reasonable to assume that some new housing units and infrastructure improvements occurred within mapped flood zones. Given the mapped extent of flood hazards in Fullerton, any increase in population or development within these zones contributes to a corresponding rise in vulnerability. However, due to the limited scale of growth and the relatively stable land use patterns over the past five years, the overall increase in flood vulnerability has likely been minimal.

Fullerton is expected to accommodate substantial residential growth to meet its RHNA allocation of 13,209 units by 2029. Much of this future development is planned within the HIOZ, which includes parcels along Commonwealth Avenue, South Harbor Boulevard, East Valencia Drive, and other areas that overlap with the mapped 500-year flood zone. These areas are likely to see increased residential density through multi-family and higher-density

housing projects. Additionally, student housing near California State University, Fullerton, may be vulnerable to mapped 500-year flood zones. While the 100-year flood zone is not expected to experience new development, the overlap between planned housing sites and the 500-year flood zone suggests a measurable increase in exposure to flood hazards with a 0.2 percent annual chance of occurrence.

In summary, flood vulnerability in Fullerton has increased slightly over the past five years due to modest development within mapped flood zones. However, projected growth within the 500-year flood zone, especially through the HIOZ and near CSU Fullerton, indicates a more notable rise in vulnerability over the next five years. As the City pursues higher-density and affordable housing to meet RHNA targets, it will be important to integrate flood mitigation strategies and resilient design standards into future development plans to reduce risk and protect residents in flood-prone areas.

4.6.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area, including census tracts with concentrations of individuals with AFN or limited adaptive capacity. Flooding poses a significant risk to portions of the City of Fullerton, particularly within designated 100-year and 500-year flood zones, which are distributed throughout the City with notable concentrations in the south and southwestern regions. Notably, the mapped 100-year and 500-year flood zones overlap with census tracts formally designated as areas with limited adaptive capacity and AFN populations, including Census Tracts 001404, 001801, 001802, 086701, 011000, 001902, 011601, 011602, 011403, 011502, 011504, and 011711. These tracts are known to have high concentrations of older adults, individuals with disabilities, linguistically isolated households, and residents in crowded households, multi-unit housing, or persons living in group quarters.

In addition to these identified tracts, AFN populations are distributed throughout the City and may also be impacted by flood. These individuals face unique challenges during flood events. Older adults and individuals with disabilities may have limited mobility or chronic health conditions that complicate evacuation and access to emergency services. Residents in multi-unit or crowded housing may lack financial resources or transportation options, making it difficult to relocate during flood emergencies. Linguistically isolated households may struggle to understand emergency alerts or evacuation instructions, increasing their risk during rapidly evolving flood conditions. Furthermore, flooding can disrupt access to caregivers, medical equipment, and essential services, compounding the vulnerability of AFN populations.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation Actions #1, 3, 11 and 18 to address the needs of socially vulnerable populations, including efforts to improve flood risk communication, enhance evacuation planning for AFN communities, and expand outreach to ensure residents are aware of available resources to prepare for and respond to flood hazards.

4.7 EXTREME WEATHER (DROUGHT, EXTREME HEAT, SEVERE WINDS/SANTA ANA WINDS, HEAVY RAIN, POWER OUTAGE/UTILITY FAILURE)

4.7.1 DESCRIPTION

DROUGHT

Drought is defined as a prolonged period of below-average precipitation during which available water resources fall below the statistical norm for a region. In addition to rainfall deficits, drought is characterized by factors such as vegetation stress, reduced agricultural productivity, low soil moisture, declining reservoir levels, and diminished stream flow. Droughts typically develop gradually over multi-year periods and intensify with the persistence of dry conditions. When precipitation remains below normal, stream and river flows decrease, lake and reservoir levels drop, and groundwater depths increase. If dry weather continues and water supply issues emerge, the situation may escalate into a drought. Drought cycles are common in Southern California and are influenced by climatic patterns such as El Niño and La Niña.

The term "drought" can vary in meaning depending on how water shortages affect daily life. Four commonly used definitions help describe the complexity of drought:[22]

- Agricultural drought refers to soil moisture deficiencies that impact crop health and productivity.
- Hydrological drought involves reduced stream flows and lower levels in reservoirs, lakes, and groundwater systems.
- Meteorological drought is defined by a significant departure from normal precipitation over monthly, seasonal, or annual periods.
- Regulatory (or socioeconomic) drought occurs when water availability is limited due to policy restrictions on water transfers between regions. Southern California relies heavily on imported water from the Colorado River and Northern California via aqueducts, making local drought conditions sensitive to water availability in those source regions.

While climate is a primary driver of hydrological drought, human activities such as land use changes, deforestation, land degradation, and dam construction can also influence regional water dynamics. These changes may alter infiltration and runoff rates, leading to more variable stream flows and increased drought risk downstream. As natural systems are interconnected across geographic boundaries, drought impacts can extend well beyond the area experiencing reduced precipitation.[23]

Droughts can result in a wide range of public health, safety, economic, environmental, and social impacts. Health and safety concerns are often linked to increased wildfire risk and

---

[22] NOAA, *Definition of Drought*, https://www.ncdc.noaa.gov/monitoring-references/dyk/drought-definition, accessed September 5, 2025.
[23] National Drought Mitigation Center, *Drought Basics*, https://drought.unl.edu/Education/DroughtBasics.aspx, accessed September 5, 2025.

reduced access to drinking water. Other impacts include damage to residential landscaping, degradation of urban aesthetics, fallowing of agricultural land and associated job losses, harm to fish habitats, and widespread tree mortality. Drought-stressed vegetation may also pose physical hazards, such as falling limbs or trees that can damage infrastructure. Additionally, drought conditions can accelerate the spread of invasive pests like the Invasive Shot Hole Borer (ISHB), which targets weakened trees and contributes to further ecological degradation.

In urban areas of Orange County, drought conditions typically prompt large-scale water conservation measures, including reduced water allocations and tiered pricing structures that penalize excessive use. Extended drought periods often lead to increased reliance on groundwater, which can strain local aquifers. Drought also contributes to drier vegetation, increasing the size and intensity of wildfires and complicating firefighting efforts due to limited water availability. Water and wastewater infrastructure located in wildfire-prone areas may be at greater risk of damage or service disruption. For more information on wildfire hazards, refer to Section 4.10.

EXTREME HEAT

Extreme heat conditions refer to periods when temperatures are significantly higher than the seasonal average for a specific region. These events often involve a combination of high temperatures and elevated humidity, which can lead to heat-related illnesses. The heat index, or apparent temperature, reflects how hot it feels to the human body when both air temperature and relative humidity are considered.[24] High humidity can significantly increase the heat index, reducing the body's ability to cool itself and increasing the risk of heat cramps, heat exhaustion, and heat stroke.

Extreme heat is location-specific and defined relative to the historical climate norms of a given area. The National Weather Service (NWS) provides forecasts for Orange County through its San Diego Weather Forecast Office (NWS-San Diego). Communities in the inland portion of Orange County, including Fullerton, fall within the NWS Inland Orange County zone, which encompasses the inland coastal valleys and plains. In this zone, excessive heat is generally considered to occur when ambient air temperatures reach 105°F or higher for two or more consecutive days.[25]

Excessive heat events in the region often coincide with Santa Ana Wind conditions, which can exacerbate wildfire risk. These hot, dry winds reduce atmospheric moisture, accelerate evaporation, and dry out vegetation, creating ideal conditions for wildfire ignition and spread. Dry vegetation acts as fuel, and the strong winds can rapidly drive fire through urban-wildland interface areas.

---

[24] National Weather Service, *What is the Heat Index?*, https://www.weather.gov/ama/heatindex#:~:text=The%20heat%20index%2C%20also%20known,sweat%20to%20cool%20itself%20off., accessed September 9, 2025.
[25] County of Orange and Orange County Operational Area, *Excessive Temperature Annex*, May 2021.

SEVERE WINDS/SANTA ANA WINDS

According to the National Weather Service (NWS), Santa Ana Winds occur when air from a region of high pressure over the dry, desert region of the southwestern U.S. flows westward towards low pressure located off the California coast.[26] This creates dry winds that flow east to west through the mountain passages in Southern California. These winds are most common during the cooler months of the year, occurring from September through May. Santa Ana winds typically feel warm (or even hot) because as the cool desert air moves down the side of the mountain, it is compressed, which causes the temperature of the air to rise. These strong winds can cause major property damage and increase wildfire risk because of the dryness of the winds and the speed at which they can spread a flame across the landscape.

Severe incidents of Santa Ana Winds may pose a significant risk to life and property by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. Destructive impacts to trees, power lines, and utility services also are associated with high winds. Falling trees can occasionally cause fatalities and serious structural damage and fallen power lines could cause widespread power outages and fire.

HEAVY RAIN

Heavy rains refer to events during which the amount of rainfall in a location substantially exceeds normal or typical rainfall conditions. Establishing a threshold to define periods of heavy rain varies greatly, depending on location and season. Heavy precipitation is not necessarily an indicator that the total amount of precipitation has increased, rather that precipitation is occurring in more intense events. Changes in the intensity of precipitation, coupled with changes in the interval between events, can affect overall precipitation totals.[27] One method for determining heavy rain events is to consider what percentage of a location's total annual precipitation has come from extreme, one-day events. Potential impacts of heavy rains include property damage, soil erosion, and increased flood risk, which in turn contribute to other hazards including debris flows and landslides. The contribution of heavy rains to other hazards has the potential to cause significant property damage and loss of life within the City of Fullerton.

POWER OUTAGE/UTILITY FAILURE

Power outages are a major secondary effect of severe weather events in the City. An outage could result in damaged power equipment or equipment failures and can affect multiple jurisdictions for hours. This type of event can range from a moderate event to a catastrophic regional event that may threaten human life, safety, and health, or interferences with vital services.

During severe weather incidents such as high winds, extreme heat, or severe flooding, Southern California Edison (SCE) may implement an operational practice called Public Safety

---

[26] NWS, *Mountain and Valley Winds*, https://www.weather.gov/safety/wind-mountain-valley, accessed September 9, 2025.
[27] U.S. EPA, *Climate Change Indicators: Heavy Precipitation*, https://www.epa.gov/climate-indicators/climate-change-indicators-heavy-precipitation, accessed September 9, 2025.

Power Shutoffs (PSPS) to preemptively shut off power in high-risk areas during potentially dangerous conditions. This program is designed to proactively prevent SCE facilities from starting a wildfire in at risk areas when winds and temperatures are high.

Strong Santa Ana winds, high temperatures, and low humidity are all severe weather conditions that could trigger a PSPS event. It is possible for extreme weather incidents outside of the City to trigger a PSPS that affects the service area (i.e., strong winds affecting regional infrastructure that powers SCE grids in Orange County). The frequency of these events depends on the weather and environmental factors, and SCE makes decisions based on internal threat thresholds, assessment of real-time information, and situational awareness data. When possible, SCE intends to notify customers prior to a PSPS event. When weather forecasts indicate extreme fire conditions, SCE begins predictive modeling to assess the potential impacts while monitoring weather watch alerts from the National Weather Service. Three days prior to the forecasted PSPS, SCE would coordinate first with local governments, the emergency management community, first responders, and other critical infrastructure/service providers. Two days prior to the forecasted PSPS, notices would go out to SCE customers with a follow-up one day before a notice of power shut off. It is noted that actual or sudden onset of extreme weather conditions could impact the intended coordination and notification efforts.[28]

Outside of the PSPS events, there is the potential for unplanned power outages to occur within Fullerton. SCE defines a major outage as a large, unexpected outage caused by either accidents or natural disasters. While uncommon, loss of electrical power is a potential secondary effect of heavy rains or strong winds. Other types of events that could occur is mechanical power failure due to aging equipment.

4.7.2 LOCATION/EXTENT

DROUGHT

Droughts are widespread regional events that affect the entirety of the City of Fullerton, and the larger southern California region. Geographically, drought conditions would extend to the entire City and potentially impact all residents, businesses and local agencies. Certain areas within the City may experience more severe drought impacts than others due to variations in infrastructure, water demand, and local environmental conditions.

The City of Fullerton relies on a combination of imported and local water sources to meet its water needs. As a retail water supplier, the City obtains imported potable water from the Metropolitan Water District of Southern California (MET) and local groundwater from the Orange County Groundwater Basin.[29] Drought conditions are not confined to the City's boundaries, and affect the broader region, including the watersheds and infrastructure that support MET and groundwater resources. Reduced rainfall and snowpack across can limit imported supplies, while prolonged dry periods can diminish groundwater recharge. These

[28] Southern California Edison, *Public Safety Power Shutoff*, https://www.sce.com/wildfire/psps, accessed September 9, 2025.
[29] City of Fullerton, *2020 Urban Water Management Plan*, June, 2021.

regional impacts directly influence the availability of water within Fullerton, and drought-related stress on regional sources can still result in water shortages, restrictions, and increased costs for all residents and businesses in the City.

Drought severity and extent depends on numerous factors including duration, intensity, and geographic extent, as well as regional water supply demands by humans and vegetation. The magnitude of drought is usually measured by time and severity of the hydrologic deficit. The United States Drought Monitor provides weekly data identifying portions of the United States that are experiencing drought. The intensity of drought is categorized as one five classifications: abnormally dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought: moderate (D1), severe (D2), extreme (D3), and exceptional (D4); refer to **Table 4-12: Drought Severity Classification**.

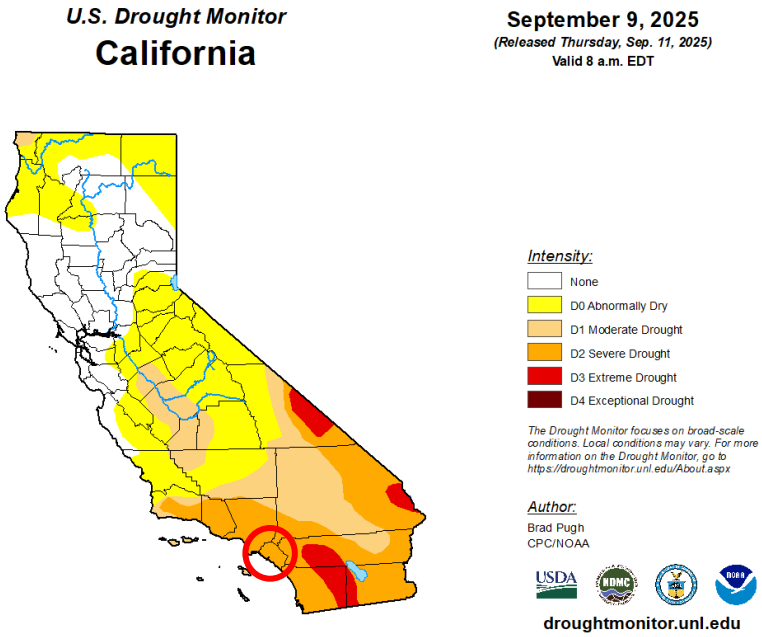
TABLE 4-12: DROUGHT SEVERITY CLASSIFICATION

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures.
D1	Moderate Drought	Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D2	Severe Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested.
D3	Extreme Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed.
D4	Exceptional Drought	Major crop/pasture losses; widespread water shortages or restrictions.

Source: U.S. Drought Monitor, Drought Classification, https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx, accessed September 9, 2025.

Figure 4-3: Drought Monitor Map identifies areas of drought within California and labels them by intensity as shown in **Table 4-12** above. As of September, 2025, the entirety of Orange County, including the City of Fullerton, is experiencing "Moderate Drought" according to the United States Drought Monitor. The Drought Monitor is not a forecast but looks backward, providing a weekly assessment of drought conditions based on how much precipitation did or did not fall.

FIGURE 4-3: DROUGHT MONITOR MAP



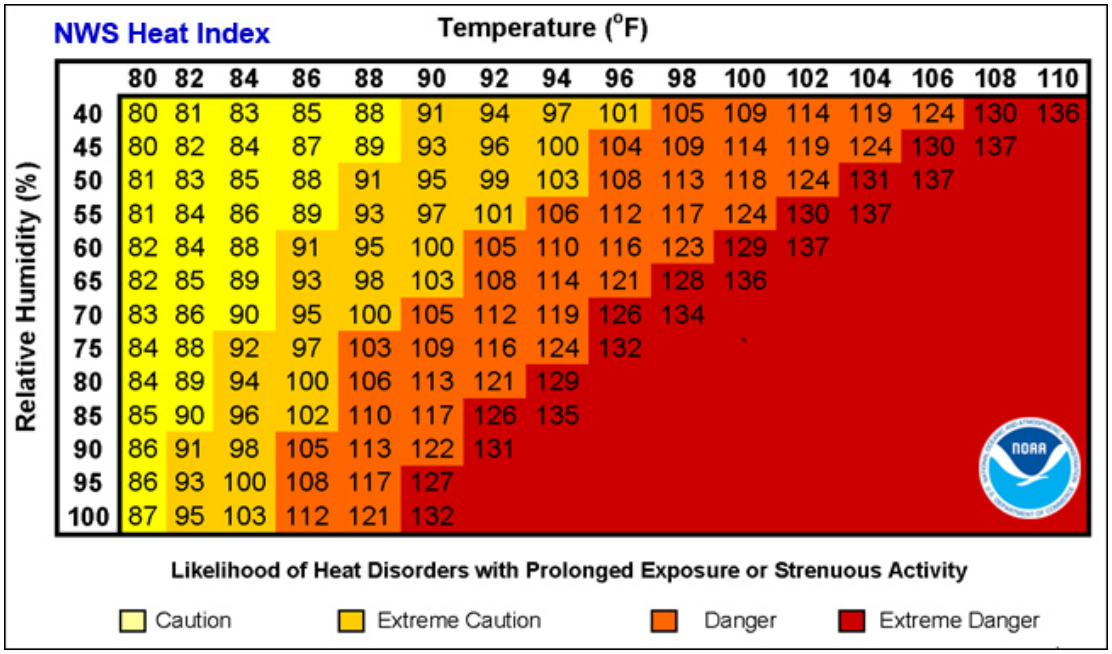
Source: U.S. Drought Monitor, California, https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA, accessed September 11, 2025.

EXTREME HEAT

Extreme heat events are regional occurrences, and the geographic extent of extreme heat conditions would extend to every resident within the City. As temperatures rise across the region, all parts of Fullerton would experience elevated heat levels, which can strain local infrastructure, increase energy demand, and pose health risks.

Extreme heat events typically last multiple days. The National Weather Service (NWS) uses a heat index, or apparent temperature, to help identify extreme heat events and predict extent of potential impacts. The dangers of extreme heat increase with time and exposure, meaning that a prolonged period of extreme heat over just a few days can be particularly dangerous. **Figure 4-4: Heat Index** shows the likelihood of heat disorder with prolonged exposure or strenuous activity associated with temperature and relative humidity.

FIGURE 4-4: HEAT INDEX



Source: National Weather Service, What is the Heat Index?, https://www.weather.gov/ama/heatindex#:~:text=The%20heat%20index%2C%20also%20known,sweat%20to%20cool%20itself%20off., accessed September 12, 2025.

The greatest risks from extreme heat events are health related. Although some heat-related illnesses are often minor and/or temporary such as heat rash, heat cramps, and heat exhaustion, extreme heat can overwhelm the body's ability to maintain a safe internal temperature, causing a person's body temperature to reach dangerous levels. If a person's internal temperature rises to 104°F or above, heatstroke can occur.[30] Heatstroke can cause fainting, seizures, and mental impairment. If left untreated, it may lead to permanent organ damage, coma, or death.

Extreme heat is unlikely to result in physical damage to structures; however, residents may experience the effects of heat exhaustion or heat stroke. Additionally, the increased use of air conditioning may put stress on the power grid and lead to power outages. The National Weather Service (NWS) provides weather forecasts for Fullerton based on data collected from the Santa Ana and Los Angeles NOAA Weather Radio (NWR) stations. Anticipated extreme heat events would be reported by these weather stations, including specific anticipated duration and severity.

SEVERE WINDS/SANTA ANA WINDS

Wind events such as the Santa Ana Winds typically impact large areas and can potentially impact any area within the City. Depending on the conditions of the wind event, impacts could

[30] Mayo Clinic, *Heat Exhaustion*, https://www.mayoclinic.org/diseases-conditions/heat-exhaustion/symptoms-causes/syc-20373250, accessed September 12, 2025.

be widespread or localized. It is reasonable to assume that severe winds or Santa Ana winds and their impacts could be experienced at any location throughout the City.

The Beaufort Wind Scale relates wind speed to observed conditions and is used to measure the intensity of wind events up to 74 miles per hour. Observed impacts associated with strong winds range from swaying trees to devastating or widespread damage.

TABLE 4-13: BEAUFORT WIND SCALE

BEAUFORT SCALE	WIND SPEED	DESCRIPTION
0: Calm	Less than 1 mph	Smoke rises vertically.
1: Light air	1 to 3 mph	Direction shown by smoke drift but not by wind vanes.
2: Light breeze	4 to 7 mph	Wind felt on face; leaves rustle; wind vane moved by wind.
3: Gentle breeze	8 to 12 mph	Leaves and small twigs in constant motion; light flags extended.
4: Moderate breeze	13 to 18 mph	Raises dust and loose paper; small branches moved.
5: Fresh breeze	19 to 24 mph	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6: Strong breeze	25 to 31 mph	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7: Near gale	32 to 38 mph	Whole trees in motion; inconvenience felt when walking against the wind.
8: Gale	39 to 46 mph	Twigs break off trees; generally impedes progress.
9: Severe gale	47 to 54 mph	Slight structural damage (chimney pots and slates removed).
10: Storm	55 to 63 mph	Seldom experienced inland; trees uprooted; considerable structural damage.
11: Violent storm	64 to 72 mph	Exceptionally high waves (small and medium-size ships might be for a time lost to view behind the waves).
12: Hurricane	73 mph and above	Very rarely experienced; accompanied by widespread damage.

Source: National Weather Service, Beaufort Wind Scale, https://www.weather.gov/mfl/beaufort, accessed September 12, 2025.

The specific magnitude, severity, and actual impacts from wind events in the City can vary greatly depending on sustained windspeed and event duration. Fullerton experiences mild seasonal variation in average hourly wind speeds throughout the year. The windier season lasts from September through May, with average speeds exceeding 6.5 mph and peaking in December at 7.7 mph, while the calmer season spans May 7 to November 9, with August being

the calmest month at an average of 5.1 mph.[31] Santa Ana wind events that sporadically affect the City regularly reach speeds of 40 to 60 mph with gusts up to 100 mph.[32] Santa Ana Wind events can result in damaged buildings and infrastructure, damaging personal property including vehicles and homes. Downed trees, damaged power lines, and power outages may also affect residents within the City.

HEAVY RAIN

Heavy rain events typically affect large geographic areas and can impact any location within the City of Fullerton. While the severity of impacts may vary depending on local topography, drainage infrastructure, and land use, it is reasonable to assume that intense rainfall and associated hazards—such as flooding or stormwater runoff—could be experienced throughout the City. These events are regional in nature, and their effects are not limited to isolated portions of the planning area.

An indicator for the extent of a heavy rain season is the Oceanic Niño Index (ONI), used to monitor the El Niño-Southern Oscillation (ENSO). To calculate the ONI, scientists from the National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center calculate the average sea surface temperature in the El Niño 3.4 region (area of the east-central equatorial Pacific Ocean) for each month, and then average it with values from the previous and following months. The observed difference from the average temperature in that region, whether warmer or cooler, is the ONI value for that three-month "season". El Niño and La Niña conditions can affect climate conditions in southern California significantly. El Niño causes the Pacific jet stream to move south of the neutral position, often bringing increased precipitation and secondary impacts such as increased flooding. La Niña usually has the opposite effect and causes the Pacific jet stream to move northward. This usually leads to dry and drought-like conditions, along with warmer than normal temperatures during the winter.[33] It is important to note that El Niño and La Niña are only predictors of precipitation in southern California and may not always result in rainy or dry years.

The average annual precipitation for Fullerton is 11.86 inches with the most precipitation occurring from November through April. January and February are typically the wettest months of the year with an average of 2.85 and 3.02 inches per month respectively.[34] Typically, municipal drainage infrastructure systems are designed to accommodate heavy rain events. During uncharacteristically heavy storms or rain events (such as those caused by an El Niño weather pattern), these drainage systems may not be sufficient to move stormwater flows and

---

[31] Weather Spark, *Climate and Average Weather Year Round in Fullerton*, https://weatherspark.com/y/1846/Average-Weather-in-Fullerton-California-United-States-Year-Round, accessed September 12, 2025.
[32] Britannica, *Santa Ana winds*, https://www.britannica.com/science/Santa-Ana-winds, accessed September 12, 2025.
[33] NOAA, *What are El Niño and La Niña?,* https://oceanservice.noaa.gov/facts/ninonina.html, accessed September 12, 2025.
[34] U.S. Climate Data, *Climate Fullerton - California*, https://www.usclimatedata.com/climate/fullerton/california/united-states/usca1767, accessed September 12, 2025.

thus, result in flooding. Severe storms could also cause overtopping of dams or reservoirs or threaten slope stability.

POWER OUTAGE/UTILITY FAILURE

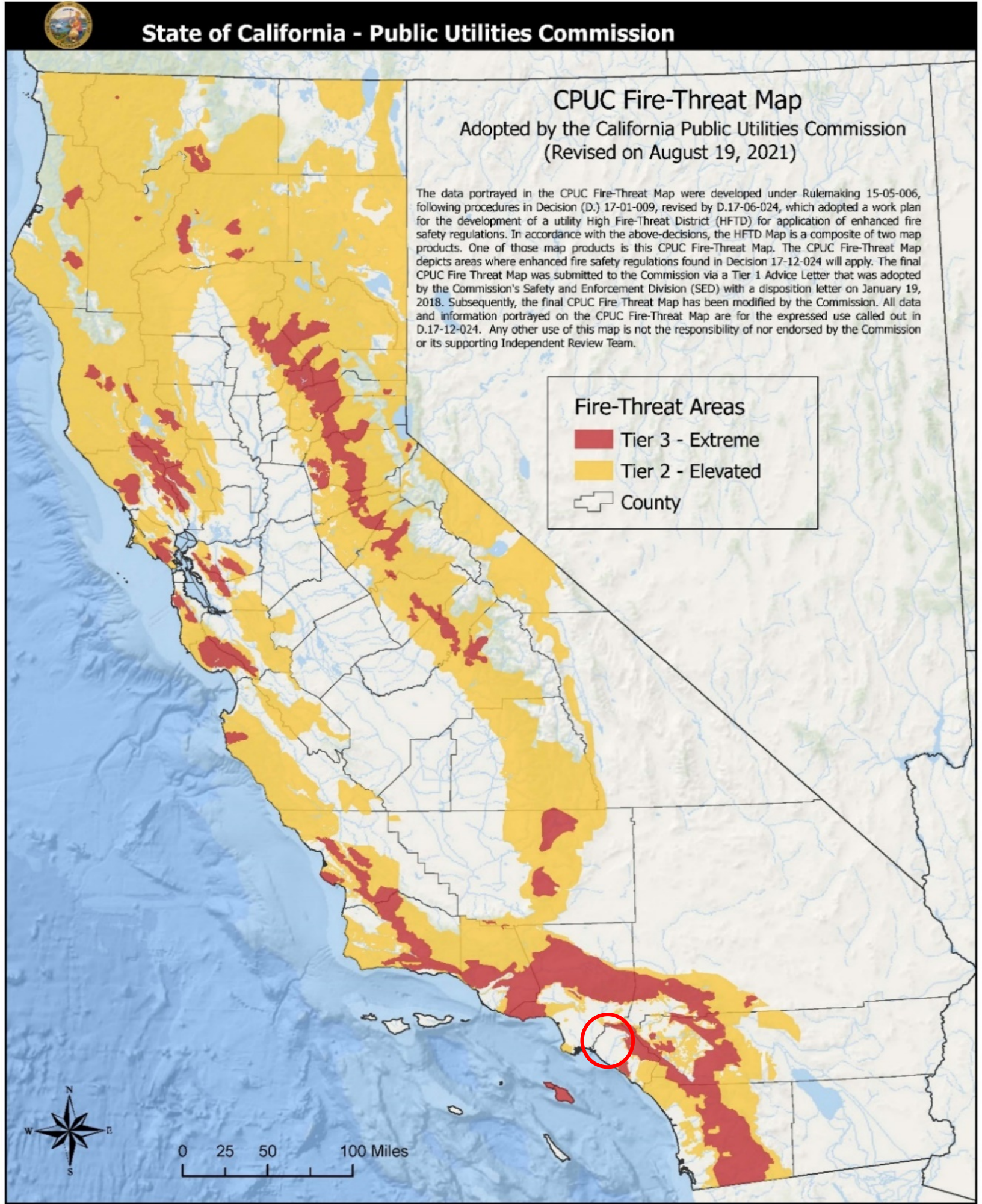
PSPS events often target wildland areas with high wildfire risk, but they can impact a much wider region. The targeted areas are more vulnerable due to environmental conditions like dry vegetation, high winds, and steep terrain, which may cause wildfires when power lines are damaged. However, because the electrical grid is interconnected, de-energizing circuits in high-risk zones can lead to power outages that extend beyond the immediate area. As a result, even parts of the City of Fullerton outside designated fire risk zones may experience outages during a PSPS event, making it a citywide concern.

SCE designates High Fire Risk Areas as areas with circuits within California Public Utilities Commission's (CPUC) Tier 2 (elevated risk) and Tier 3 (extreme risk) Fire Threat Areas, refer to **Figure 4-5: CPUC Fire Threat Map**. The CPUC Fire-Threat Map was developed with input from the U.S. Forest Service, California Department of Forestry and Fire Protection, and the State's investor-owned utilities, including SCE. SCE uses their own thresholds prior to initiating a PSPS event. When evaluating weather and environmental conditions, SCE considers a variety of factors which include but are not limited to:[35]

- National Weather Service Red Flag Warnings;
- SCE meteorological assessments;
- SCE Fire Potential Index;
- SCE Fire Scientist assessments;
- Real-time situational awareness information;
- SCE Fire Management/Office of Emergency Management input;
- Concerns from local or State fire authorities;
- Mandatory or voluntary evacuation orders in place;
- Expected impact of de-energizing circuits on essential services (including public safety agencies, water pumps, traffic controls, etc.); and
- Other operational considerations to minimize wildfire ignitions.

The magnitude or extent of impacts to the City would depend on the duration of the outage and the size of the impacted area. Power outages can range from short, localized disruptions to prolonged, citywide events depending on the cause—such as equipment failure, extreme weather, or PSPS actions. Because the electrical grid is interconnected, outages initiated in high-risk wildfire zones can cascade into broader service interruptions affecting areas well outside the initial target. Longer outages can significantly disrupt daily life, impact critical infrastructure like traffic signals and water systems, and pose risks to vulnerable populations, especially during extreme heat or emergency situations.

[35] Southern California Edison Transmission and Distribution, *Transmission Inspection and Maintenance Program (TIMP)*, June 24, 2022.

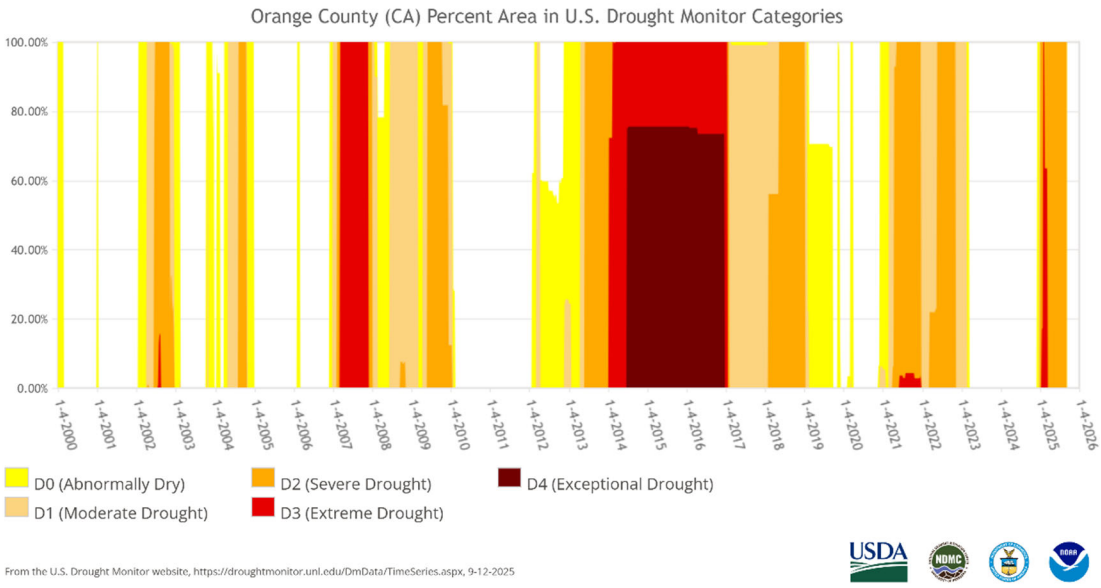

State of California - Public Utilities Commission
CPUC Fire-Threat Map
Adopted by the California Public Utilities Commission
(Revised on August 19, 2021)
The data portrayed in the CPUC Fire-Threat Map were developed under Rulemaking 15-05-006, following procedures in Decision (D.) 17-01-009, revised by D.17-06-024, which adopted a work plan for the development of a utility High Fire-Threat District (HFTD) for application of enhanced fire safety regulations. In accordance with the above-decisions, the HFTD Map is a composite of two map products. One of those map products is this CPUC Fire-Threat Map. The CPUC Fire-Threat Map depicts areas where enhanced fire safety regulations found in Decision 17-12-024 will apply. The final CPUC Fire Threat Map was submitted to the Commission via a Tier 1 Advice Letter that was adopted by the Commission's Safety and Enforcement Division (SED) with a disposition letter on January 19, 2018. Subsequently, the final CPUC Fire Threat Map has been modified by the Commission. All data and information portrayed on the CPUC Fire-Threat Map are for the expressed use called out in D.17-12-024. Any other use of this map is not the responsibility of nor endorsed by the Commission or its supporting Independent Review Team.
Fire-Threat Areas
Tier 3 - Extreme
Tier 2 - Elevated
County
N
W
E
S
0 25 50 100 Miles
For more information about the data and map depicted, or other matters related to Utility wildfire safety, please contact Terrie Prosper at Terrie.Prosper@cpuc.ca.gov or visit website at https://www.cpuc.ca.gov/industries-and-topics/wildfires/fire-threat-maps-and-fire-safety-rulemaking.
Basemap is sourced from Esri World Ocean.
Version 3 revised on August 19, 2021 is a result of Resolution SED-4 and an update to CAL FIRE's tier 1 of the High Hazard Zones.

4.7.3 PREVIOUS OCCURRENCES

DROUGHT

Historically, the City of Fullerton and Orange County have experienced various periods of drought. **Figure 4-6: Historical Drought Conditions in Orange County** shows the seasonal recurrence of drought since the year 2000.

FIGURE 4-6: HISTORICAL DROUGHT CONDITIONS IN ORANGE COUNTY



Source: U.S. Drought Monitor, Time Series, https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx, accessed September 12, 2025.

The most severe drought on record began in 2012 and continued through 2017. On January 17, 2014, the Governor of California declared a State drought emergency, and on April 1, 2015, the Governor announced the first-ever mandatory 25 percent Statewide water use reduction. As part of this reduction effort, the state proposed a series of actions to help save water, increase enforcement to prevent wasteful water use, streamline the State's drought response, and invest in new technologies that would make California more drought resilient. At the time of the announcement, the volume of Sierra Nevada snowpack was approximately 14 percent of normal. By the end of May 2014, all of California was in a condition of "extreme" or "exceptional" drought. At the same time, the volume of the Sierra Nevada snowpack had decreased to less than 10 percent of normal and water stored in Lake Oroville, the major reservoir for the State Water Project, was at 58 percent of normal.[36] After a series of winter rains, the Governor issued an executive order in April 2017 ending the drought emergency in Southern California, including Orange County.

[36] California Department of Water Resources, *California's Most Significant Droughts: Comparing Historical and Recent Conditions*, February 2015.

California saw drought conditions reoccur in during 2020 and 2021. A proclamation of a State of Emergency was made by the Governor of California for northern California counties in April of 2021, and the proclamation was expanded during summer 2021 to include the majority of northern and central California.[37] On October 19, 2021, the State of Emergency was again expanded, this time including Orange County.[38] Extreme drought and severe drought conditions persisted seasonally in Orange County throughout 2021 and 2022. However, after two wet seasons in 2023 and 2024, the Orange County was no longer suffering from widespread drought.

In 2025, drought conditions would recur in Orange County reaching the level of extreme drought in February. Since March, 2025, the entirety of Orange County has been experiencing severe drought conditions according to the United States Drought Monitor.

No federally declared disasters relating to drought have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

EXTREME HEAT

Fullerton has experienced various extreme heat events in the past. On average, Fullerton experiences 5.52 very hot days annually compared to past average temperatures.[39]

Extreme heat events do not typically cause physical damage or location-specific impacts, however, extreme heat events throughout Orange County can be used to indicate events that affected Fullerton. **Table 4-14: Orange County Extreme Heat Events** summarizes extreme heat events that occurred in Orange County in the past 5 years.

TABLE 4-14: ORANGE COUNTY EXTREME HEAT EVENTS

DATE	EVENT SUMMARY
August 14, 2020	Temperatures of 95 to 105 degrees were recorded during this heat event. The Laguna Hills CWOP recorded a high temperature of 107 degrees on August 14th.
September 17, 2020	Temperatures climbed into the upper 90s and low 100s during this heat wave. Santa Ana reached 99 degrees on the 17th and Anaheim broke a daily record, reaching 96, on the 18th.

[37] Office of Governor Gavin Newsome, *Governor Newsome Expands Drought Emergency to Klamath River, Sacramento-San Joaquin Delta, and Tulare Lake Watershed Counties*, https://www.gov.ca.gov/2021/05/10/governor-newsom-expands-drought-emergency-to-klamath-river-sacramento-san-joaquin-delta-and-tulare-lake-watershed-counties/, published May 10, 2021, accessed September 12, 2025.
[38] Office of Governor Gavin Newsom, *Governor Newsom Expands Drought Emergency Statewide, Urges Californians to Redouble Water Conservation Efforts*, https://www.gov.ca.gov/2021/10/19/governor-newsom-expands-drought-emergency-statewide-urges-californians-to-redouble-water-conservation-efforts/, accessed September 12, 2025.
[39] Cal-Adapt, *Extreme Heat Days and Warm Nights*, https://cal-adapt.org/tools/extreme-heat/, accessed September 12, 2025.

DATE	EVENT SUMMARY
September 29, 2020	High temperatures from the 90s at the beaches to just over 100 degree readings were reported a few miles inland during this heat wave. John Wayne Airport ASOS reached 100 degrees on September 30th.
October 12, 2020	Some areas recorded temperatures near 100 degrees during this heat wave from the 12th to the 16th. Santa Ana set a daily record high temperature on the 14th, hitting 96 degrees.
April 1, 2021	Temperatures reached into the upper 80s and the low 90s, including Fullerton Airport at 92 degrees.
April 28, 2021	The region saw high temperatures top out into the low to mid 90s.
June 14, 2021	Hot temperatures occurred with high temperatures in the mid to upper 90s. Anaheim broke a daily record on June 15th with a high of 96 degrees.
August 2, 2021	Some areas reached near 100 degrees on August 2nd with 90s thereafter.
August 25, 2021	The region saw widespread 90s with some locales hit near 100 degrees, including Yorba Linda on the 26th.
September 21, 2021	Anaheim broke the daily record for maximum high temperature on September 21. Anaheim recorded a high of 104 degrees, breaking the record of 102 set in 2015.
September 1, 2022	The ASOS at Fullerton Airport observed daily highs ranging from the middle to upper 90s through much of early September, with several days also exceeding 100 degrees for a daily high. The highest daily maximum temperature of 111 degrees occurred on the afternoon of Sunday, September 4th, with a high of 103 occurring on the 3rd and 8th of September.
July 11, 2023	Hot conditions occurred across inland Orange County Valleys from July 10-14. Highs reached the upper-80s and 90s each day. Fullerton ranged from 89-93 through the duration of the event.
August 28, 2023	Very hot daytime temperatures occurred across inland portions of Orange County on August 28-30th, when Heat Advisories were in effect. Highs between 91 and 103 degrees occurred each day, with Yorba Linda and Anaheim seeing the hottest temperatures, both exceeding 100 degrees on the 28th and 29th.
September 6, 2024	High temperature reached a record 112 in Anaheim on September 6, 2024. The heat wave lasted through September 9th with high temperatures of 104 to 113F across inland Orange County.

Source: NOAA, Storm Events Database, https://www.ncei.noaa.gov/stormevents/eventdetails.jsp?id=1218698, accessed September 12, 2025.

Most recently a heat advisory was issued for inland Orange County areas from August 21 through August 22, 2025; temperatures were expected to reach up to 95 degrees.

No federally declared disasters relating to extreme heat have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

SEVERE WINDS/SANTA ANA WINDS

Severe winds and Santa Ana wind events seasonally affect the City of Fullerton, typically between the cooler months of September through May. In January 2025, Southern California experienced a powerful Santa Ana windstorm, with gusts reaching up to 80 mph across the region. Orange County was placed under a High Wind Warning, and while coastal and canyon areas faced the greatest risk of fire and structural damage, inland cities like Fullerton were largely spared from direct impacts. Residents may have experienced brief power flickers and fallen tree limbs, but no major incidents were reported. By April 2025, the National Weather Service and local forecasters officially declared the end of the Santa Ana wind season, which typically spans from September through May.[40] Fullerton, like many inland Orange County communities, has a seasonal history of Santa Ana winds, but the primary risks—wildfire spread and power outages—have not resulted in significant direct impacts to the city in recent years.

No federally declared disasters related to Santa Ana Wind events have impacted the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

HEAVY RAIN

The City of Fullerton has a long history of experiencing intense rainfall events, many of which have shaped regional weather preparedness and infrastructure planning. Historical records indicate that prolonged and heavy rains have periodically impacted the area since the 19th century, often tied to broader storm systems affecting Southern California.

One of the earliest documented episodes occurred during the winter of 1861–1862, when a month-long deluge known as the "Noachian Deluge of California" drenched the region. Rainfall during this period was so extensive that low-lying areas between Anaheim and the Coyote Hills—now part of Fullerton—were submerged under several feet of water. Subsequent decades saw additional episodes of extreme precipitation, including notable storms in 1900 and 1916, which overwhelmed natural drainage and contributed to the eventual creation of the Orange County Flood Control District.

In more recent years, Fullerton has been affected by a series of heavy rain events linked to atmospheric rivers, tropical systems, and winter storm cycles. December 2021 brought widespread rainfall across Southern California, with Fullerton receiving between 1.5 to 2.5 inches of precipitation in a short span. The winter of 2022–2023 was marked by relentless storms that saturated soils and strained stormwater infrastructure throughout Orange County. Fullerton, while not the epicenter of damage, likely experienced significant rainfall and temporary disruptions due to runoff and pooling in older neighborhoods.

Tropical Storm Hilary in August 2023 delivered another round of intense rain, with Fullerton recording approximately 2 inches during the peak of the storm. Though the city avoided major

[40] FOX 11 Los Angeles, *'Life-threatening' windstorm brings critical fire weather back to Southern California*, https://www.foxla.com/news/southern-california-windstorm-january-7-2025, accessed September 18, 2025.

impacts, crews responded to blocked drains and minor street-level water accumulation. February 2024 saw back-to-back atmospheric rivers that prompted a statewide emergency declaration. Fullerton again received substantial rainfall, contributing to seasonal challenges such as traffic delays and maintenance demands.

In the last five years, two FEMA-declared disasters and five state declared disasters for flood or winter storms have affected the planning area:

- EM-3591-CA: Severe Winter Storms, Flooding, and Mudslides – January 8, 2023
- EM-3592-CA: Severe Winter Storms, Flooding, Landslides, and Mudslides – March 9, 2023
- State Disaster 146: Severe Winter Storms – February 2024
- State Disaster 142: Tropical Storm Hilary – August 2023
- State Disaster 141: Severe Winter Storms – February 2023 - March 2023
- State Disaster 140: Severe Winter Storms – December 2022 - January 2023
- State Disaster 127: Severe Winter Storms – December 2021

Refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area** for a full list of federally declared disasters affecting the planning area.

POWER OUTAGE/UTILITY FAILURE

The City of Fullerton does not have a recent history of city-wide power outages resulting from extreme weather, wildfire risk, or PSPS events. While there are areas of CPUC Tier 2 and Tier 3 Fire Threat areas located to the north of the city, Fullerton itself has remained largely unaffected by significant outages tied to wildfire-related shutoffs. Its location outside the highest-risk zones has helped limit direct impacts from PSPS protocols implemented by SCE.

Smaller-scale outages do occur periodically in Fullerton, typically as a result of equipment failure, traffic accidents, or precautionary responses to severe weather. For example, in September 2025, a pickup truck struck a power pole in neighboring La Habra, knocking out electricity to more than 2,300 customers across the area.[41] Though Fullerton was not directly impacted, the incident illustrates how localized disruptions can affect nearby communities.

In January 2025, powerful Santa Ana winds and wildfire conditions swept across Southern California, leaving thousands without power in areas such as Riverside, Ventura, and parts of Los Angeles County.[42] Fullerton avoided major outages during this event, but the high winds and dry conditions prompted regional alerts and utility monitoring. Similarly, in July 2025, SCE issued warnings of potential PSPS activations to prevent wildfire ignition during a heatwave

[41] The Orange County Register, *More than 2,300 lose power after pickup truck hits power pole in La Habra*, https://www.ocregister.com/2025/09/14/more-than-2300-lose-power-after-pickup-truck-hits-power-pole-in-la-habra/, accessed September 19, 2025.
[42] Los Angeles Daily News, *Tens of thousands in Southern California could lose power starting Monday with return of high winds*, https://www.dailynews.com/2025/01/18/thousands-in-southern-california-still-without-power-because-of-high-wind-damage/, accessed September 19, 2025.

and elevated fire weather conditions.[43] These warnings did not result in shutoffs within Fullerton, but they reflect the broader vulnerability of Southern California's power grid during peak fire season.

Overall, Fullerton's experience with power outages has been limited to short-term, isolated incidents without significant citywide impacts. While the city remains adjacent to areas with elevated fire risk, it has not been subject to direct PSPS events. Regional trends and nearby disruptions underscore the importance of continued coordination with utility providers and emergency preparedness for weather-related service interruptions.

No federally declared disasters leading to power outages have impacted the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

4.7.4 PROBABILITY OF FUTURE OCCURRENCES

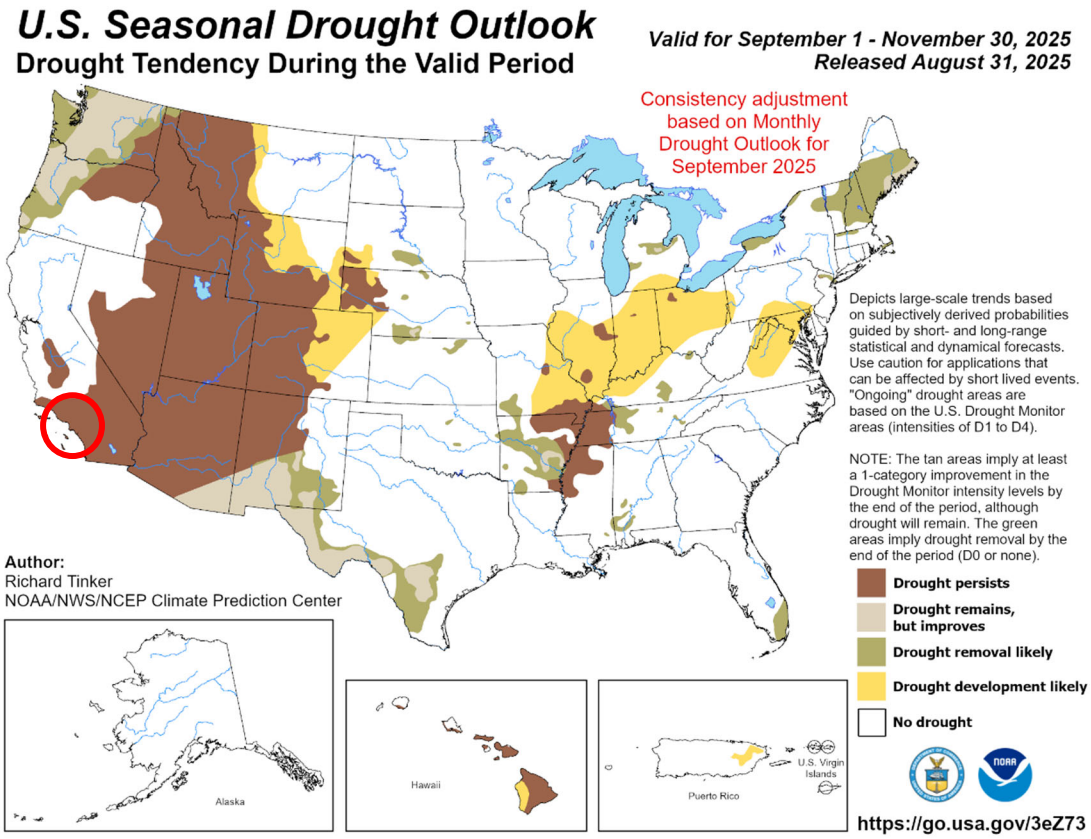
DROUGHT

California weather is classified by a typical dry and wet season. During the wet season, the state relies on heavy precipitation events to constitute the majority of the annual total rainfall, so the absence of any event can significantly impact water availability. Certain atmospheric circulation patterns define California's temperature and precipitation extremes. Examining these patterns, researchers discovered that atmospheric conditions associated with extreme drought have become increasingly common in recent decades.[44]

Based on previous occurrences and trends in California, the likelihood that Orange County and the City of Fullerton will continue to experience drought conditions in the future is considered high. The United States Seasonal Drought Outlook depicts large-scale trends based on United States Drought Monitor areas (intensities of D1 to D4), as shown in **Figure 4-7: United States Seasonal Drought Outlook**. It is indicated that drought development is likely to persist throughout southern California, including Fullerton and Orange County. While the City received high levels of precipitation from 2022 through 2024, drought is a known reoccurring hazard within the southern California region and current drought conditions exist throughout the region. Based on current and historical data, drought is considered to have a high probability for reoccurrence within the City of Fullerton and the southern California region.

[43] San Bernardino Sun, *SCE warns of potential power shutoffs to prevent wildfires*, https://www.sbsun.com/2025/07/04/sce-warns-of-potential-power-shutoffs-to-prevent-wildfires/, accessed September 19, 2025.
[44] Stanford News, *California drought patterns becoming more common, Stanford scientists say*, https://news.stanford.edu/2016/04/01/drought-patterns-change-040116/, published April 1, 2016, accessed September 12, 2025.

FIGURE 4-7: UNITED STATE SEASONAL DROUGHT OUTLOOK



Source: National Weather Service Climate Prediction Center, U.S. Seasonal Drought Outlook, https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php, accessed September 12, 2025.

EXTREME HEAT

The City of Fullerton has experienced multiple extreme heat events in recent years, with inland Orange County regularly recording temperatures in the upper 90s and beyond during summer and early fall. While these events have not resulted in federally declared disasters or widespread physical damage, they have prompted heat advisories and elevated public health concerns across the region.

According to the Cal-Adapt Extreme Heat Days tool, Fullerton has an expected average of 5.52 extreme heat days per year, with projections showing a potential maximum of 17 days annually as climate change intensifies.[45] Based on historical trends and regional climate modeling, there is a highly likely probability of future extreme heat occurrences—defined as a 90 to 100 percent chance of occurrence in any given year or a recurrence interval of less than one year. The LHMP planning team has designated extreme heat as a high hazard

[45] Cal-Adapt, *Extreme Heat Days*, https://cal-adapt.org/dashboard/data-explorer?metric=extreme-heat, accessed September 19, 2025.

consideration, recognizing that future events may occur with greater frequency and longer duration, particularly during peak summer months.

SEVERE WINDS/SANTA ANA WINDS

Severe wind events, including seasonal Santa Ana winds, are a recurring hazard in Southern California and have historically affected Orange County between the months of September and May.

Based on regional wind patterns and historical data, there is a highly likely probability of future severe wind occurrences in Fullerton—defined as a 90 to 100 percent chance of occurrence in any given year or a recurrence interval of less than one year. The LHMP planning team has designated severe wind as a high hazard consideration, recognizing that Santa Ana winds will continue to pose seasonal risks.

HEAVY RAIN

Heavy rain events are a seasonally recurring hazard in Fullerton, typically concentrated between late fall and early spring. Historical records show that the city has experienced multiple impactful rainstorms over the past century, including atmospheric river events, tropical systems, and prolonged winter storms. While not all heavy rain events result in flooding, they frequently lead to saturated soils, overwhelmed drainage systems, and localized disruptions.

Based on regional climate patterns and historical frequency, there is a highly likely probability of future heavy rain occurrences in Fullerton—defined as a 90 to 100 perent chance of occurrence in any given year or a recurrence interval of less than one year. The LHMP planning team has designated heavy rain as a high hazard consideration, recognizing that seasonal storms will continue to affect the city. As climate change contributes to more intense and erratic precipitation cycles, future events may bring higher rainfall totals over shorter durations, increasing the potential for runoff-related impacts even in areas with established flood control infrastructure.

POWER OUTAGE/UTILITY FAILURE

Power outages and utility failures in Fullerton are typically limited to short-term, localized incidents caused by equipment malfunctions, traffic accidents, or precautionary responses to severe weather. While Fullerton is located near areas designated as CPUC Fire Threat areas, the city has not experienced significant outages or PSPS events due to wildfire risk. Regional windstorms and wildfire conditions have prompted PSPS warnings and widespread outages in neighboring communities, but Fullerton has remained largely unaffected.

Given the city's infrastructure and historical trends, there is a highly likely probability of future utility disruptions—defined as a 90 to 100 percent chance of occurrence in any given year or a recurrence interval of less than one year. These events are expected to remain isolated and short-term, without major citywide impacts. The LHMP planning team has designated power outage and utility failure as a high hazard consideration, recognizing that while Fullerton is not highly vulnerable to large-scale outages, regional conditions and aging infrastructure may contribute to occasional service interruptions.

4.7.5 CLIMATE CHANGE

DROUGHT

Climate change is a phenomenon that will likely exacerbate drought hazards. According to the 2023 California State Hazard Mitigation Plan, climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the twenty-first century due to changing weather patterns such as more frequent and extended periods of high temperature conditions.[46] Rising temperatures intensify drought by accelerating evaporation rates, reducing snowpack, and increasing water demand. This increase in extreme heat contributes to soil moisture loss and diminished water availability, compounding the effects of reduced precipitation.

Climate change is also altering precipitation patterns, leading to variability in rainfall and snowfall. Climate change can cause more overall rainfall or snowfall due to increased global temperatures and thus increased atmospheric capacity for moisture. However, this moisture doesn't fall evenly, some regions experience heavier and more frequent storms, while others become drier. In southern California, it is anticipated that increased temperature will cause drier conditions, leading to less rainfall and snowpack which in turns affects water supplies.[47]

These changes pose serious challenges for local water management, agriculture, and public health, especially in communities dependent on vulnerable water systems. The City of Fullerton has developed a comprehensive approach to water planning through its 2020 Urban Water Management Plan (UWMP), which evaluates long-term water supply reliability and outlines strategies to address future demand and potential shortages. Fullerton sources its water from both imported supplies via the Metropolitan Water District of Southern California and local groundwater from the Orange County Groundwater Basin, managed by the Orange County Water District. To prepare for drought and other supply disruptions, the City's Water Shortage Contingency Plan (WSCP) provides a structured framework for reducing demand and augmenting supply during varying levels of shortage, ensuring that residents and stakeholders have access to water even during prolonged drought conditions.

EXTREME HEAT

Climate change is projected to increase the frequency and intensity of extreme heat events in Orange County, including the City of Fullerton. Average temperatures have already increased throughout the region and the daily maximum average temperature, an indicator of extreme heat events, is expected to continue to rise into the mid- and late-century.[48] These hotter

---

[46] California Governor's Office of Emergency Services, *2023 California State Hazard Mitigation Plan*, https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/2023-California-SHMP_Volume-1-Exec-Summary_11.10.2023.pdf, accessed September 9, 2025.
[47] California Climate Adaptation Strategy 2024, *Summary of Projected Climate Change Impacts on California*, https://climateresilience.ca.gov/overview/impacts.html, accessed September 11, 2025.
[48] California Climate Adaptation Strategy 2024, *Summary of Projected Climate Change Impacts on California*, https://climateresilience.ca.gov/overview/impacts.html, accessed September 11, 2025.

conditions will not only increase the risk of heat-related illnesses, particularly among vulnerable populations such as older adults, children, and outdoor workers, but also strain energy systems and public health infrastructure.

Furthermore, this increase in extreme heat will compound existing climate risks like drought and wildfire, and may lead to more frequent heat advisories and emergency responses. Climate change and the projected increased occurrences of extreme heat events highlight the need for proactive adaptation strategies, such as cooling centers, heat alert systems, and urban greening, to protect public health and community resilience.

SEVERE WINDS/SANTA ANA WINDS

Climate change is influencing the behavior and impacts of Santa Ana winds in Southern California, including Orange County and Fullerton. Research from the Scripps Institution of Oceanography suggests that climate change may suppress the overall frequency of Santa Ana wind events, particularly in the fall and spring, while sharpening their seasonal concentration around winter months.[49] However, even with fewer events, the combination of warmer temperatures, prolonged drought, and dry vegetation indicate that the remaining wind events are still dangerous during the wildfire season. Furthermore, increased intensity of severe winds in the winter months may compound with heavy rains and winter storms.

HEAVY RAIN

Climate change will affect the frequency and intensity of heavy rain events, causing secondary impacts such as flooding, erosion, and . As global temperatures rise, the atmosphere holds more moisture, which can lead to more intense storms and heavier precipitation. However, this does not necessarily mean more consistent rainfall overall. In fact, climate change is also expected to increase the frequency and severity of droughts due to shifting weather patterns, longer dry spells, and reduced snowpack. This apparent contradiction, more intense rain but also more drought, is explained by the growing variability in precipitation.[50] Dry periods may become longer and more extreme, while wet periods may bring short bursts of intense rainfall that are less effective at replenishing water supplies and more likely to cause flooding.

POWER OUTAGE/UTILITY FAILURE

As the effects of climate change continue to intensify, PSPS events are expected to become more frequent due to the increasing severity of wildfire-related hazards. Rising temperatures, prolonged droughts, and more frequent high-wind events create ideal conditions for wildfires, particularly in areas with accumulated dry vegetation. These conditions increase the likelihood

[49] Guzman-Morales, J., & Gershunov, A., Scripps Institution of Oceanography, University of California, San Diego, *Climate change suppresses Santa Ana winds of Southern California and sharpens their seasonality*, 2019.
[50] US EPA, *Future of Climate Change*, https://www.epa.gov/climatechange-science/future-climate-change, accessed September 11, 2025.

that electrical infrastructure could spark a fire, prompting utilities to proactively shut off power to reduce the risk of ignition.[51]

Climate change also contributes to more extreme weather events, such as high winds, heatwaves, and storms. These can directly damage power infrastructure, leading to outages even outside of PSPS protocols. According to Climate Central, weather-related power outages in the U.S. have doubled over the past two decades, with California among the most affected states.[52] In the event of a severe storm, for example, high winds may down power lines, triggering a PSPS or causing unplanned outages that threaten public safety and disrupt critical services. As these climate-driven hazards grow more frequent and intense, communities like Fullerton must prepare for both the direct and indirect impacts of power loss.

4.7.6 VULNERABILITY ASSESSMENT

Extreme weather including drought, extreme heat, severe wind events, heavy rain, and utility failures are regional hazards. Thus, the entire City of Fullerton is considered potentially vulnerable to their impacts. This includes all 167 critical facilities and 69 facilities of concern. Critical facilities encompass municipal government buildings, fire and police stations essential for emergency response and continuity of operations, community centers and parks that may serve as emergency staging areas or cooling centers, and vital infrastructure such as water systems, power utilities, and transportation networks. Within the City, persons aged 65 and older may face particular vulnerability from these extreme weather hazards due to various factors associated with aging such as chronic health conditions, medications that may increase weather sensitivity, and reduced ability to regulate body temperature. Facilities of concern include schools, healthcare and assisted living facilities, and other community services that support residents.

While these hazards vary in their physical effects, each poses a significant threat to City operations, infrastructure, and public health:

Drought and Extreme Heat: These hazards do not typically cause direct physical damage to buildings, but they can severely strain water and energy systems. Drought may reduce water availability for residents, businesses, and firefighting operations, while also contributing to wildfire risk and ecological stress. Extreme heat can lead to heat-related illnesses, particularly among vulnerable populations, and increase demand on power systems, potentially resulting in outages. Cooling centers may be needed to mitigate health risks during prolonged heat events.

Severe Winds and Santa Ana Winds: These events can damage trees, power lines, and lightweight structures. While critical facilities are generally built to withstand such conditions, fallen debris and downed utilities can disrupt operations, communications, and emergency

---

[51] California Public Utilities Commission, *Public Safety Power Shutoffs (PSPS)*, https://www.cpuc.ca.gov/PSPS/, accessed September 11, 2025.
[52] Climate Central, Weather-related Power Outages Rising, https://www.climatecentral.org/climate-matters/weather-related-power-outages-rising, published April 24, 2024, accessed September 11, 2025.

response. Santa Ana Winds also elevate wildfire risk and may exacerbate respiratory conditions among residents.

Heavy Rain: Intense rainfall can overwhelm stormwater systems, leading to sewer overflows, flooded roads, and water contamination. These impacts can disrupt transportation and damage homes and businesses. Flooding may also result in temporary or permanent displacement of residents.

Power Outages and Utility Failures: These can occur independently or be triggered by other hazards such as extreme heat or severe winds. Utility disruptions affect lighting, heating, cooling, and water treatment systems, with cascading effects on hospitals, emergency services, and daily operations. Businesses may suffer, while residents face risks related to medical equipment failure, and communication breakdowns.

In addition to these facilities, the entire population of 141,278 residents and all 47,484 occupied housing units within Fullerton are considered vulnerable to these hazards. The combined impacts could result in widespread service disruptions, economic losses, health risks, and displacement. Given the scale and interconnected nature of these threats, it is essential to adopt a citywide mitigation strategy that addresses the full range of potential consequences and prioritizes resilience across infrastructure, services, and communities.

4.7.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Over the past five years, the City of Fullerton has experienced minimal population growth and moderate increases in housing development, primarily through residential infill, mixed-use redevelopment, and rehabilitation of existing structures. Because extreme weather hazards—such as drought, extreme heat, severe winds (including Santa Ana winds), heavy rain, and power outage/utility failure—have the potential to impact the entire city, any increase in population or development inherently contributes to increased vulnerability. While some of these hazards, such as severe winds and heavy rain, may result in physical damage to buildings, infrastructure, and utilities, others—like drought, extreme heat, and power outages—primarily affect residents through public health risks, service disruptions, and economic impacts. Given the modest scale of growth, the overall increase in vulnerability to extreme weather hazards over the past five years is considered marginal.

Over the next five years, Fullerton is expected to see notable residential growth as it works to meet its RHNA allocation of 13,209 housing units by 2029. Much of this development will occur within the HIOZ, which includes 759 parcels distributed across the city which may be developed through higher-density housing projects, including multi-family housing. As the city's population and built environment expand, exposure to extreme weather hazards—such as drought, extreme heat, severe winds, heavy rain, and power outages—will increase. While some of these hazards, like wind and heavy rain, may cause physical damage to buildings and infrastructure, others may disrupt essential services or strain energy and water systems, particularly in denser residential areas.

In summary, vulnerability to extreme weather hazards in Fullerton has increased slightly over the past five years due to modest development and population growth. However, projected

increases in residential density and population suggest a more notable rise in exposure over the next five years. Because these hazards can affect the entire city and manifest in both physical damage and indirect impacts on health, safety, and infrastructure, it is essential that future development incorporate resilient design, infrastructure, and emergency preparedness strategies to mitigate the growing risks associated with extreme weather.

4.7.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area – including those with AFN or limited adaptive capacity – and the characteristics that make those populations more vulnerable to hazards. The impacts of extreme weather would apply to the entirety of the planning area, including census tracts with concentrations of individuals with AFN or limited adaptive capacity. Census Tracts 001404, 001801, 001802, 086701, 011000, 001902, 011601, 011602, 011403, 011502, 011504, and 011711 are known to have high concentrations of older adults, individuals with disabilities, linguistically isolated households, and residents in crowded households, multi-unit housing, or persons living in group quarters. Additionally, it is understood that these vulnerable populations may exist throughout the City and face unique challenges to extreme weather hazards.

Older adults are particularly vulnerable to extreme heat and power outages due to increased risk of heat-related illness and dependence on climate control systems. Many may have chronic health conditions that are exacerbated by poor air quality during Santa Ana winds or limited access to water during drought. Mobility limitations can make it difficult to evacuate or access cooling centers during heat waves or shelters during severe storms. People with physical, sensory, or cognitive disabilities may face barriers to receiving emergency alerts, evacuating during severe weather, or accessing medical care during utility failures. Those who rely on powered medical devices or mobility aids are especially at risk during power outages. Heavy rain and wind events can create physical hazards that are more difficult to navigate for individuals with limited mobility. Language barriers can prevent residents from receiving or understanding emergency instructions, weather alerts, or information about available resources such as cooling centers or water distribution during drought. These households may also be less likely to engage with preparedness campaigns unless materials are translated and culturally tailored. Residents in crowded households, multi-unit housing, or group quarters may have limited access to cooling or heating systems, and may be more affected by utility failures due to shared infrastructure. Overcrowding can increase the health risks during extreme heat or poor air quality events. In group quarters, evacuation during severe weather may be logistically complex, and access to emergency supplies may be limited.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation Actions #1, 3, 11, 18, 57, 58, and 59 with these groups in mind, including efforts to expand access to cooling centers and emergency shelters, improve multilingual emergency communications, and support continuity of care for individuals dependent on utilities or caregivers during extreme weather events.

4.8 GEOLOGIC HAZARDS (LANDSLIDE, SUBSIDENCE)

4.8.1 DESCRIPTION

LANDSLIDE

Landslide is a generalized term for a falling mass of soil or rocks. When a hillside or slope becomes unstable, downslope movement of rock and soil occurs under the direct influence of gravity. Landslides are often sudden, although some occur very slowly over a long period of time. Loose and fractured materials are more likely to slide than compact materials or solid rock, and steep slopes are at greater risk than gentle rises.

Landslides are usually induced by either earthquakes or saturated slopes. The shaking of an earthquake can decrease slope stability, or in a more severe instance, fracture the earth material enough that the material slides. Moisture-induced landslides can occur when the ground soaks up enough water that the soil becomes loose and unstable. This is often the result of intense or long-lasting rainfall, but can also result from a pipeline burst or overwatering landscapes. Loss of vegetation to fire or drought many cause an area to be more vulnerable to landslides. Vegetation holds soil in place and without the root system of trees, bushes, and other plants, the land is more likely to slide away.[53]

One type of landslide that is different from debris flows or rock flows are deep-seated landslides. Deep-seated landslides are not necessarily triggered by any single storm or earthquake. Rather, these types of landslides occur weeks to months after heavy rainfall ends, when water has had time to percolate deeper under the surface to saturate weak zones of rock. This creates a "landslide plane" under the saturated weight of the overlying rock and soil.[54] The landslide plane may often be associated with earlier slides and can occur regardless of whether rain is occurring or not. As these landslides begin so deeply, they tend to carry more material and cover more territory than other types of slides. Deep-seated landslides generally occur on moderately steep slopes, travel much slower than mudflows or debris flows, and can continue for several days.

Regardless of the cause or specific form, a landslide can damage or destroy structures or roadways in its path. Underground infrastructure, such as pipelines or telecommunication lines, may be severed during a landslide. This could lead to infrastructure induced flooding if water pipes, or sewage lines burst. In addition to property damage, landslides can crush or bury people, creating a risk of serious injury or death.

---

[53] National Geographic Society, *Landslide*, https://education.nationalgeographic.org/resource/landslide/, accessed September 9, 2025.
[54] California Department of Conservation, *2023 California Landslide Response*, https://www.conservation.ca.gov/cgs/landslides/2023, accessed September 9, 2025.

SUBSIDENCE

The USGS defines land subsidence as a gradual settling or sudden sinking of the Earth's surface due to removal or displacement of earth materials.[55] The primary causes include aquifer-system compaction associated with groundwater withdrawals, drainage of organic soils, underground mining, and natural compaction or collapse, such as with sinkholes or thawing permafrost. More than 17,000 square miles of the United States have been directly affected by subsidence, with 80 percent of known land subsidence in the United States occurring as a consequence of groundwater use.[56]

In southern California, the primary cause of land subsidence is groundwater extraction in areas where aquifer recharge is exceeded by the amount of water extracted, a phenomenon known as "over-drafting." Depletion of aquifers creates a lower water table, allowing for permanent land subsidence and a reduction in the total storage capacity of the aquifer system. Damage to infrastructure, reduction in water quality, and potential intrusion from seawater in coastal areas have been documented as a result of land subsidence. Conditions typical to southern California, including an arid climate, high population density, and frequent drought conditions all exacerbate over-drafting incidents.

4.8.2 LOCATION/EXTENT

LANDSLIDE

Landslides are generally more likely to occur in areas with steep slopes, unstable soils. Within the City, landslides are generally limited to areas with notable slopes or unstable terrain, which tend to be concentrated in specific parts of the city. Most of Fullerton is relatively flat and heavily urbanized, making the majority of the city less susceptible to landslide hazards. However, there are certain areas within the city that are vulnerable to landslide. **Figure 4-8: Landslide Hazard Zone** identifies landslide hazard zones within the City.

Generally, the City of Fullerton does not have extensive landslide hazard zones. The topography of Fullerton is characterized by hills and valleys but also flat terrain. While the northern and southern areas of the city are predominantly flat and urbanized—making them less susceptible to landslides—the central region features steeper slopes that increase the potential for slope instability. Mapped landslide zones are sparse but are primarily located within the Panorama Nature Preserve and the Robert E. Ward Nature Preserve. These natural open space areas, characterized by slopes and elevation changes, represent the highest potential for landslide activity within the city.

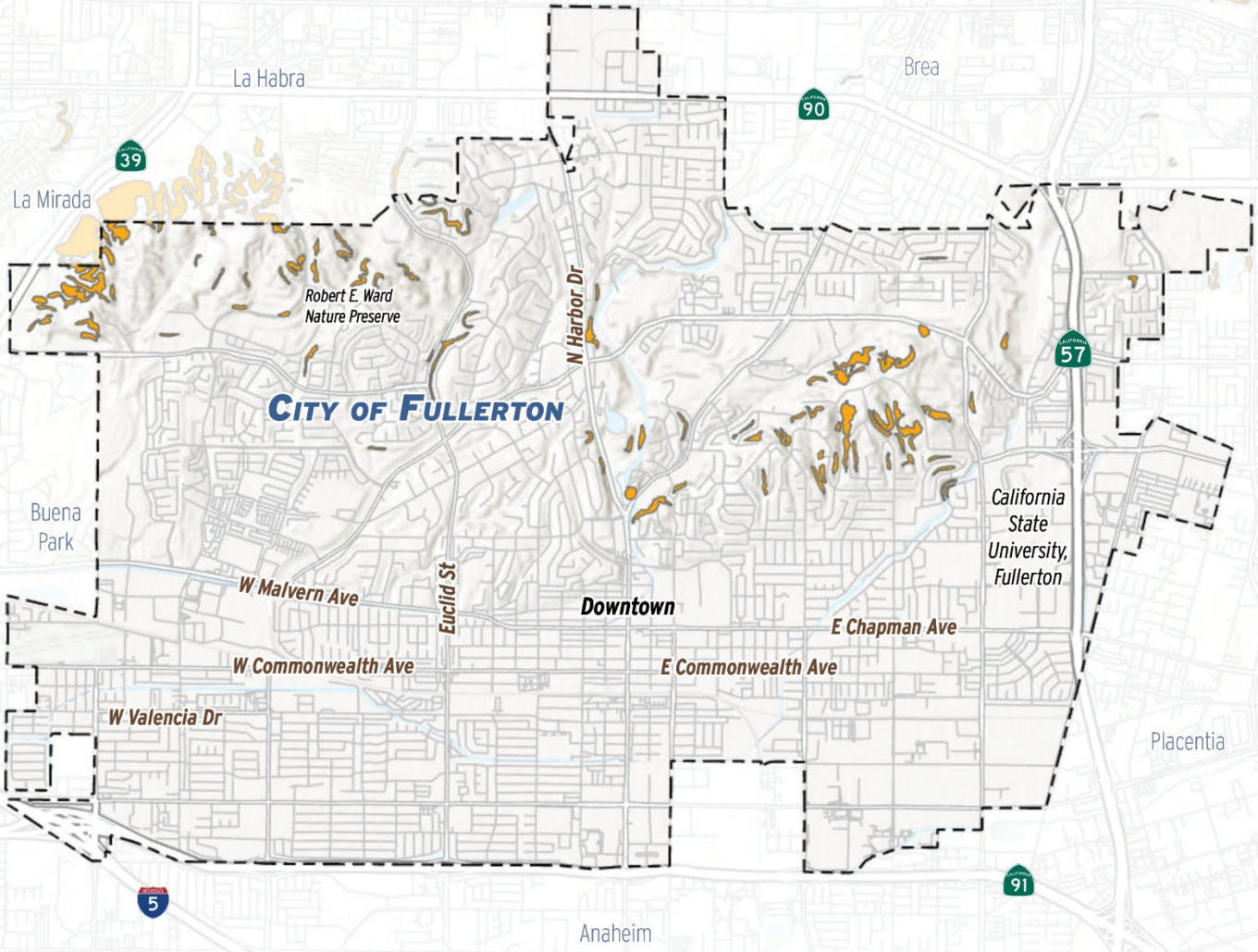
In urban areas like Fullerton, landslides—especially those triggered by intense precipitation—can cause significant localized damage. These events typically occur on steep slopes and can result in rapid movement of soil and debris, damaging homes, roads, and utility infrastructure. Urban environments are particularly vulnerable due to human alterations to the landscape,

[55] USGS, *Land Subsidence*, https://www.usgs.gov/mission-areas/water-resources/science/land-subsidence?qt-science_center_objects=0#qt-science_center_objects, accessed September 9, 2025.
[56] USGS, *Water Science School: Land Subsidence*, https://www.usgs.gov/water-science-school/science/land-subsidence, accessed September 9, 2025.

such as grading, road cuts, and reduced vegetation cover, which can destabilize slopes. Studies show that urban areas may be up to 10 times more sensitive to precipitation-triggered landslides than rural areas, meaning even moderate rainfall can lead to slope failures.[57] While most landslides are relatively small in area, their sudden onset and potential to disrupt densely populated zones make them a serious hazard.

[57] American Geophysical Union, *Urban areas more likely to have precipitation-triggered landslides, exposing growing populations to slide hazards*, https://news.agu.org/press-release/urban-areas-more-likely-to-have-precipitation-triggered-landslides/, accessed September 12, 2025.

Figure 4-8: Landslide Hazard Zone



Legend

City of Fullerton Municipal Boundary

Landslide Hazard Zone

0 1 mile 2 miles

N

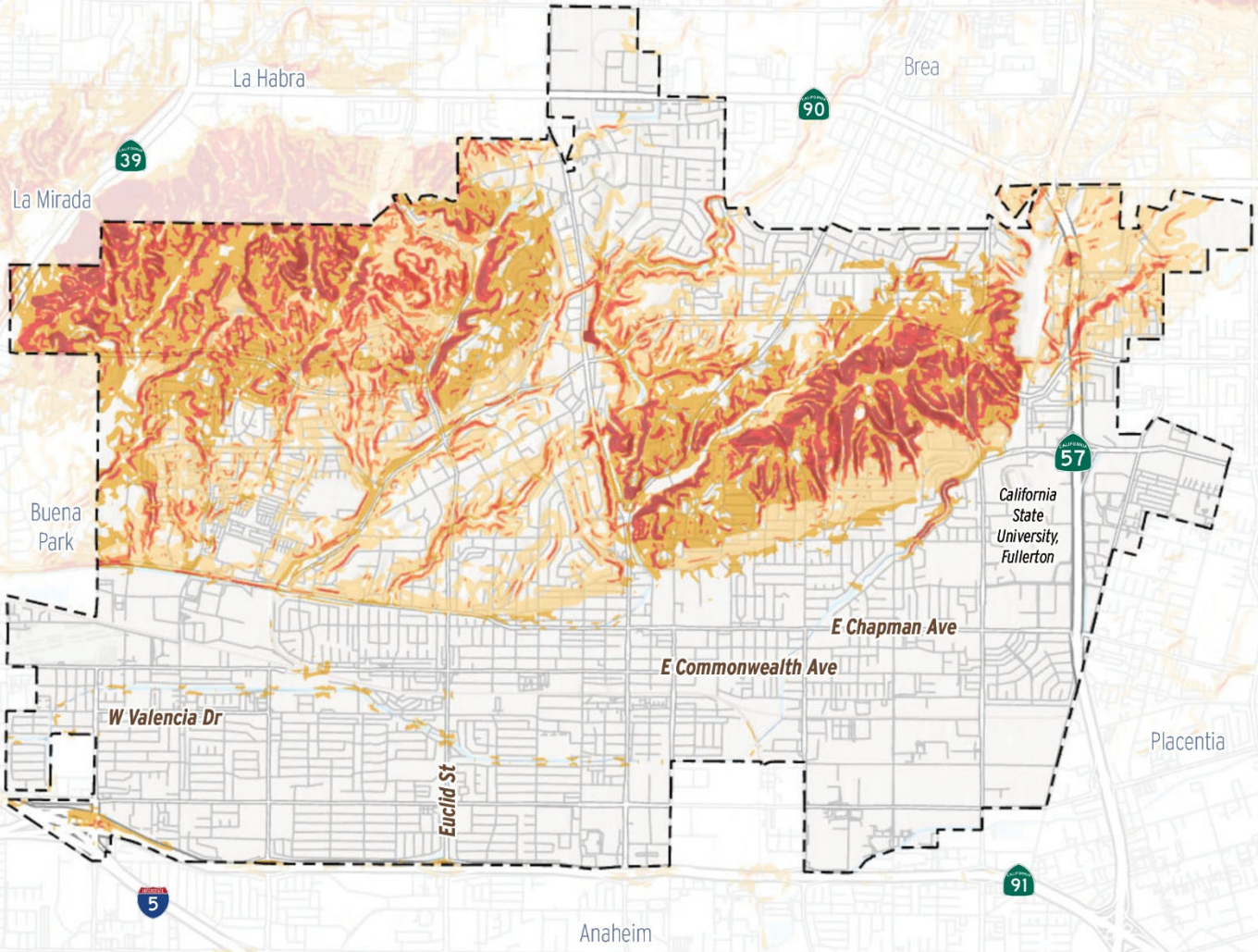
Source: CA Dept of Conservation, CGS, CA Natural Resources Agency GIS 2019; City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

In addition to the landslide hazard zones discussed above, Fullerton is susceptible to deep-seated landslide hazards. **Figure 4-9: Deep-Seated Landslide Zones** shows landslide hazard by susceptibility class.

Deep-seated landslide hazard zones in Fullerton are more extensive than typical surface landslide areas and generally affect the same hillside regions of the City, particularly around the two nature preserves. However, these zones also extend into surrounding areas to a lesser degree, reflecting broader subsurface instability. The susceptibility of these zones is classified from Class III to Class X, with lower classes being more common throughout the City. Only a few locations reach the highest levels of susceptibility, typically in steeper terrain.

Deep-seated landslides differ from surface slides in that they involve movement of large volumes of earth extending into bedrock, often covering wide areas and progressing slowly over weeks or months. In cities, these types of landslides can be particularly destructive due to their scale and the difficulty in detecting early movement. They can cause extensive damage to infrastructure, including roads, foundations, and underground utilities, and may lead to long-term land instability. Although typically slower-moving, deep-seated landslides can result in catastrophic failures if not identified and mitigated early.

Figure 4-9:
Deep-Seated Landslide Zones



Legend

City of Fullerton Municipal Boundary

Susceptibility Class

- Class III
- Class V
- Class VI
- Class VII
- Class VIII
- Class IX
- Class X

0 1 mile 2 miles

N

Source: California Geological Survey 2010, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

SUBSIDENCE

Reliable land subsidence mapping is limited for the City of Fullerton, and land subsidence may potentially impact any area within the City. Land subsidence is more likely to occur in the southern portions of the city, particularly in areas that overlie the Orange County Groundwater Basin. These southern areas are closer to the basin's center, where groundwater extraction has historically been more concentrated. However, it is important to note that specific or discrete locations of land subsidence risk within Fullerton are not currently mapped. The potential for subsidence is influenced by subsurface conditions and groundwater management practices, making it a diffuse hazard rather than one confined to clearly defined zones.

Land subsidence is a gradual and ongoing process that can result in long-term impacts to infrastructure, utilities, and buildings. In Fullerton, much of the city, especially the southern areas, is already developed, which increases the potential for damage if subsidence were to occur. Impacts may include damage to roads, pipelines, and foundations, as well as changes in drainage patterns that could exacerbate flooding risks.

4.8.3 PREVIOUS OCCURRENCES

LANDSLIDE

There is a limited history of landslide incidents within the City of Fullerton. While the city's topography includes hills and valleys, much of Fullerton—particularly the northern and southern areas—is characterized by flat, urbanized terrain that is generally not conducive to landslide activity. The central region of the city features steeper slopes, and mapped landslide hazard zones are sparse, primarily located within the Panorama Nature Preserve and the Robert E. Ward Nature Preserve. These natural open space areas, with their elevation changes and slope characteristics, represent the highest potential for slope instability within the city.

The only recorded landslide in the city happened in January of 2005 when a five-day rainstorm destabilized an embankment at the 2000 block of N. Euclid Avenue. While the landslide did not cause any injuries, deaths, or significant property damage, the street and an adjacent recreational trail were partially washed out for a few days. During the same episode, a second landslide occurred between blocks 1700 and 1900 on Harbor Boulevard. The resulting destabilization partially washed-out Harbor Boulevard but caused no other impacts.

In the past five years, two FEMA-declared disaster events listed landslides and mudslides as contributing hazards:

- EM-3591-CA: Severe Winter Storms, Flooding, and Mudslides – January 8, 2023
- EM-3592-CA: Severe Winter Storms, Flooding, Landslides, and Mudslides – March 9, 2023

However, the landslides and mudslides associated with these events did not impact the Fullerton planning area. The city primarily experienced heavy rainfall, and no slope failures or debris flows were reported. Based on available records and staff accounts, Fullerton has not experienced any notable landslide activity in recent history; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

SUBSIDENCE

There is no documented history of land subsidence incidents within the City of Fullerton. While subsidence is a known hazard in parts of Orange County due to groundwater extraction and subsurface conditions, Fullerton has not experienced any reported cases of ground sinking, structural damage, or infrastructure disruption attributable to land subsidence. City staff have not identified any past events or localized impacts related to this hazard.

No federally declared disasters relating to land subsidence have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

4.8.4 PROBABILITY OF FUTURE OCCURRENCES

LANDSLIDE

Given the topography and mapped hazard zones within Fullerton, the probability of future landslides is considered likely. This probability is defined as a 10 to 90 percent probability of occurrence in any given year or a recurrence interval of one to 10 years. While most of the city is relatively flat and urbanized, certain areas with steeper terrain such as within the Panorama Nature Preserve and the Robert E. Ward Nature Preserve present elevated risks for both surface and deep-seated landslide activity.

The presence of mapped landslide hazard zones and deep-seated susceptibility classes in these hillside regions indicates a persistent potential for slope instability, especially during periods of intense or prolonged rainfall. Although Fullerton has not experienced frequent or large-scale landslide events, the combination of steep slopes and seasonal storm activity supports the LHMP planning team's designation of landslide as a medium hazard consideration. Future events are expected to remain localized but could result in significant impacts to infrastructure and public safety if they occur in developed or heavily trafficked areas.

SUBSIDENCE

Land subsidence is considered a gradual hazard, with potential to affect various parts of the city over time. While reliable subsidence mapping is limited, the southern portions of Fullerton overlying the Orange County Groundwater Basin are more susceptible due to historic groundwater extraction and subsurface conditions. Because land subsidence is influenced by long-term groundwater management practices rather than discrete surface features, its occurrence is difficult to predict and not confined to clearly defined zones.

Given the limited history of land subsidence and managed groundwater use, there is a likely probability of future land subsidence—defined as a 10 to 90 percent chance of occurrence in any given year or a recurrence interval of one to 10 years. The LHMP planning team has designated land subsidence as a medium hazard consideration, recognizing that events may be slow-moving and subtle. Land subsidence can result in long-term impacts to infrastructure, utilities, and drainage systems, however, continued monitoring and sustainable groundwater management may be effective for minimizing future risks.

4.8.5 CLIMATE CHANGE

LANDSLIDE

Landslides are generally caused by one of two factors, seismic activity, and soil saturation. Earthquakes and ground shaking are not linked to climate change, however heavy rains are affected by climate change and understood to contribute to saturated soils and landslides. Climate change is linked to increased precipitation and more frequent and/or severe storms. California is already experiencing climate changing impacts with increasing variable precipitations and becoming the highest variability of year-to-year precipitation in the contiguous United States.[58] Increased rainfall due to climate change will lead to saturated slopes, erosion, and likely will exacerbate the effects of landslide within the planning area.

Climate change is intensifying both wildfire activity and extreme rainfall events, which together increase the risk of landslides and mudslides. As temperatures rise and droughts become more frequent, vegetation on hillsides becomes more vulnerable to burning during wildfires. This loss of vegetation reduces slope stability, as plant roots help anchor soil and absorb rainfall. At the same time, climate change is also increasing the intensity of rainstorms, which can deliver large volumes of water in short periods. When heavy rain falls on fire-scarred slopes, the absence of vegetation allows water to saturate and destabilize the soil, triggering debris flows and landslides.

SUBSIDENCE

While drought driven by climate change is likely to continue and place an increased burden on local aquifers, regional leadership and groundwater sustainability plans reduce the likelihood of future overdraft conditions. Reductions in overdraft conditions reduce the likelihood of land subsidence occurrences. As mentioned above, water purveyors have taken critical steps to monitor and reduce dependence on groundwater resources including implementing water waste prevention ordinances, water metering, conservation pricing, public education and outreach, and programs to assess and manage water loss. These steps promote water use efficiency and reduce the demand for groundwater. Thus, while drought is expected to continually occur in the southern California region, land subsidence as a result of groundwater extraction is not likely to occur in the City of Fullerton.

4.8.6 VULNERABILITY ASSESSMENT

LANDSLIDE

To identify populations at risk for landslide hazards, landslide hazard data layers from the California Geological Survey were overlaid and compared with City parcel data in Geographic Information Systems, ArcGIS. If a hazard layer either completely or partially overlapped with a parcel in the data layer, then the entire parcel is conservatively considered vulnerable in this analysis. In many instances, the landslide hazard zone intersected with only small portions of individual properties. However, to provide a detailed understanding of risk and vulnerability

[58] California Climate Adaptation Strategy 2024, *Summary of Projected Climate Change Impacts on California*, https://climateresilience.ca.gov/overview/impacts.html, accessed September 11, 2025.

as part of this hazard mitigation plan, these parcels (including all residential and non-residential development on the parcel, regardless of location) are considered vulnerable.

Landslide hazards in the City of Fullerton are primarily concentrated in hillside and sloped areas, where geological conditions increase the risk of slope instability. These mapped landslide hazard zones intersect with a limited number of critical facilities and facilities of concern. A detailed inventory of these vulnerable assets is provided in **Table 4-15: Critical Facilities and Facilities of Concern Vulnerable to Landslide**, which lists the specific facilities located within landslide-prone areas.

TABLE 4-15: CRITICAL FACILITIES AND FACILITIES OF CONCERN VULNERABLE TO LANDSLIDE

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
Critical Facilities			
39	Bridge 55C0120	Bridge	Assumed $583/SF
84	Hawks Point Pump Station (1)	Pump Station	$525,000
85	Hawks Point Pump Station (2)	Pump Station	$525,000
86	Hawks Pointe Reservoir	Reservoir	$1,500,000
95	Hillcrest Reservoir	Reservoir	$1,500,000
102	Las Palmas Pump Station (1)	Pump Station	$525,000
103	Las Palmas Pump Station (2)	Pump Station	$525,000
104	Las Palmas Reservoir	Reservoir	$1,500,000
132	Upper Acacia-T1 Reservoir	Reservoir	$1,500,000
133	Upper Acacia-T2 Reservoir	Reservoir	$1,500,000
Facilities of Concern			
46	Sunrise of Fullerton	Healthcare/Assisted Living Facility	$6,536,250
62	The Pavilion at Sunny Hills	Healthcare/Assisted Living Facility	$6,536,250

In total, 10 critical facilities are located within mapped landslide hazard zones. These include one transportation bridge and several water system components such as pump stations and reservoirs, which are essential for maintaining water supply and pressure throughout the City. Additionally, two facilities of concern are located in these zones—both senior living or nursing facilities that serve residents and may require specialized evacuation procedures in the event of a hazard.

Damage to these facilities from a landslide event could result in significant operational disruptions. Impacts may include compromised water delivery and storage systems, restricted transportation access due to bridge damage, and threats to the safety and mobility of elderly

residents in assisted living facilities. Landslides could also hinder emergency response efforts in affected areas and require extensive repair and stabilization work to restore infrastructure and services.

Additionally, approximately 2,517 residential units are located within the landslide hazard zone. The vulnerability assessment cross-referenced hazard layers with parcel data layers in GIS. The number of vulnerable residential units multiplied by the average of 2.91 persons per household for Fullerton indicates that approximately 7,322 people reside in the landslide hazard zone. Additionally, approximately 103,193,284 square feet of non-residential structures are located within the landslide hazard area. Refer to **Table 4-16: Populations at Risk for Landslide** for a summary of vulnerable residents, residential units, and non-residential buildings.

TABLE 4-16: POPULATIONS AT RISK FOR LANDSLIDE

RESIDENTS AT RISK	RESIDENTIAL UNITS AT RISK	NON-RESIDENTIAL AREA AT RISK (SQ.FT.)
7,322 residents	2,516 residential units	103,193,284 sq. ft.

Impacts of landslides would depend on location and severity of the event; however, landslides could have significant impacts on various aspects of a community. Landslides may obstruct transportation and evacuation routes, making it difficult for residents to evacuate and for emergency responders to reach affected areas. Developed areas, including homes and businesses, can be damaged or destroyed, leading to significant economic losses and displacement of residents. Natural resources such as the City's streams and creeks can be altered or contaminated, affecting water quality and ecosystems. Landslides may also hinder the day-to-day operations of the city, impacting critical facilities and facilities of concern that provide essential services. Given the potential for widespread operational and economic impacts, targeted mitigation and emergency planning are essential to protect lives, property, and critical services in landslide-prone areas.

SUBSIDENCE

Land subsidence has the potential to affect any area of the city. This includes all 167 critical facilities, 69 facilities of concern, 47,484 occupied residential units, and the full population of 141,278 residents.

Subsidence can result in gradual ground sinkage, which may compromise the structural integrity of buildings and infrastructure across residential, commercial, and industrial areas. Homes may develop foundation cracks or become structurally unstable, particularly in lower elevation zones where subsidence may also increase flood risk during heavy rainfall. Businesses and factories could experience infrastructure instability, operational disruptions, and economic losses due to damaged facilities and equipment.

Critical facilities that support water systems, communications, transportation, and energy delivery may be especially vulnerable. Damage to these assets could delay essential services, hinder emergency response, and disrupt daily operations. Facilities of concern—such as

schools, healthcare centers, and assisted living facilities—may face safety risks and require costly repairs or temporary relocation.

Given the potential for widespread and unpredictable impacts, it is essential to incorporate subsidence into citywide mitigation planning to protect infrastructure, maintain service continuity, and safeguard residents across Fullerton.

4.8.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Since the 2020 LHMP, the City of Fullerton has experienced marginal population growth—less than one percent—and moderate increases in housing development. Most new development has consisted of residential infill, mixed-use redevelopment, and rehabilitation of existing structures. While mapped landslide hazard zones and deep-seated landslide areas are concentrated in the hills of the city, land subsidence is a non-mapped hazard and may affect any part of Fullerton. Therefore, it is reasonable to assume that some development over the past five years has occurred in areas potentially vulnerable to subsidence or landslide hazards. Given the limited scale of growth, the overall increase in vulnerability to geologic hazards during this period is considered minimal.

Over the next five years, Fullerton is expected to accommodate significant residential growth to meet its RHNA allocation of 13,209 housing units by 2029. Much of this development will occur within the HIOZ, which includes 759 parcels located primarily in the southern and central portions of the city—along Commonwealth Avenue, South Harbor Boulevard, East Valencia Drive. These areas do not overlap with mapped landslide hazard zones, and significant development is not expected to occur in the hillside areas where landslide risk is highest. However, because land subsidence is a non-mapped hazard, the entirety of the city—including areas targeted for future development—may be considered potentially vulnerable. As Fullerton pursues higher-density residential projects, including multi-family and student-oriented housing, the expansion of the built environment and supporting infrastructure may contribute to increased exposure to subsidence-related impacts. Accordingly, vulnerability to geologic hazards is expected to rise moderately over the next five years.

Thus, vulnerability to geologic hazards in Fullerton has increased slightly over the past five years due to modest development and population growth, primarily in areas outside of mapped landslide zones. However, future development—particularly within the HIOZ and other infill areas—may lead to a more notable increase in exposure to land subsidence, which is considered a citywide hazard.

4.8.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area, including census tracts with concentrations of individuals with AFN or limited adaptive capacity. The northern and southern areas of the city are predominantly flat and urbanized, making them less susceptible to landslides. The central region features steeper slopes that increase the potential for slope instability. Mapped landslide zones are sparse but are primarily located within the Panorama Nature Preserve and the Robert E. Ward Nature Preserve. Mapped landslide hazard zones and

deep-seated landslide hazard zones generally do not overlap with these designated census tracts, with the exception of Census Tract 011000, which is overlapped by the mapped deep-seated landslide hazards. However, it is understood that AFN and limited adaptive capacity populations are distributed throughout the City and may be impacted by landslide hazards, particularly if they reside near hazard zones or rely on infrastructure and services that traverse these areas.

Vulnerable groups, including older adults, individuals with disabilities, linguistically isolated households, and residents in multi-unit or group housing, face heightened risks from landslide hazards due to mobility challenges, communication barriers, limited access to transportation, and potential isolation from emergency services if infrastructure is compromised. Populations with limited mobility, such as older adults and individuals with disabilities, may face challenges evacuating or relocating in the event of slope failure or road closures caused by landslides. Residents in multi-unit housing, crowded households, or group quarters may lack access to transportation or financial resources needed to respond to sudden disruptions. Linguistically isolated households may not receive or understand emergency alerts or evacuation instructions, especially if landslide risks escalate quickly due to heavy rainfall or seismic activity. Additionally, landslides can damage utility lines, roadways, and access routes, potentially isolating vulnerable populations from emergency services or caregivers.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation Actions #1, 3, 11, 18, 51, 53 and 54 with these groups in mind, including efforts to improve emergency communication systems, assess transportation access for AFN populations near hazard zones, and ensure continuity of care and services in the event of infrastructure disruption caused by landslides.

4.9 SEISMIC HAZARDS (FAULT RUPTURE, GROUND SHAKING, LIQUEFACTION)

4.9.1 DESCRIPTION

The US Geological Survey (USGS) defines an earthquake as a sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip (or any other sudden stress changes in the earth).[59] Faults are fractures along the earth's crust between two blocks of earth and can be defined as a strike slip, normal, or thrust faults. Earthquakes occur without warning, and result in effects such as fault rupture, ground shaking, and liquefaction described below.

FAULT RUPTURE

Fault rupture or surface faulting is the differential movement of two sides of a fracture, where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults, which occur based on the type of underlying fault. Faults occur at boundaries between large sections of the earth's surface, called tectonic plates. Most of California

[59] USGS, *Earthquake Hazard Program*, https://www.usgs.gov/glossary/earthquake-hazards-program#E, accessed September 9, 2025.

underlies the North American plate, but coastal areas (including Fullerton) are on the Pacific plate. The San Andreas Fault is the main boundary between North American and Pacific plates, but other fault lines can be found up to 200 miles away. The presence of the San Andreas Fault and other regional faults is the reason for frequent seismic activity in California.

Where surface traces of active faults are found in California, an Alquist-Priolo fault zone is mapped. A regulatory zone, which is a 500-foot buffer, is then created around the mapped Alquist-Priolo fault zone.[60] If an active surface fault has a potential for surface rupture, a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally fifty feet). The intent of the Alquist-Priolo Act is to reduce losses from surface fault rupture, and to prevent the construction of buildings used for human occupancy on the surface trace of active faults. Before a new development is permitted, cities and counties require a geologic investigation to demonstrate that proposed buildings will not be constructed on active faults.[61] Quaternary faults are not included in the Alquist-Priolo fault zone as they include faults that moved within the last 2.6 million years and have not ruptured recently enough to be considered under the Alquist-Priolo fault zone definition. Thus, only faults with Holocene surface rupture evidence are included in these zones such as the nearby San Andreas fault zone.

GROUND SHAKING

Ground motion is the movement of the earth's surface from earthquakes. Ground motion is produced by seismic waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the earth and along its surface.[62] Seismic waves produce ground vibrations above the surface. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motion.[63]

Seismic shaking can be strong enough to result in widespread devastation or be virtually undetectable by the average person. The intensity of seismic shaking is a result of the release by the fault rupture (how much of the accumulated stress was released), the length of the rupture (the longer the slip along the fault line, the greater the shaking), and the depth at which the rupture occurs (ruptures that occur closer to the surface often cause stronger shaking). Usually, areas closest to the site of the rupture experience the greatest shaking, although differences in geology and soil can also have an impact. Seismic shaking can damage

---

[60] California Department of Conservation, *Alquist-Priolo Earthquake Fault Zones*, https://www.conservation.ca.gov/cgs/alquist-priolo, accessed September 9, 2025.
[61] USGS, *Alquist-Priolo Faults*, https://earthquake.usgs.gov/education/geologicmaps/apfaults.php, accessed September 9, 2025.
[62] USGS, *Earthquake Hazard Program*, https://www.usgs.gov/glossary/earthquake-hazards-program#E, accessed September 9, 2025.
[63] Yeats, Robert. *Living with Earthquakes in the Pacific Northwest. Amplification of Seismic Waves by Soft Surficial Deposits*. https://geo.libretexts.org/Bookshelves/Seismology/Living_With_Earthquakes_in_The_Pacific_Northwest_%28Yeats%29/06%3A_Shaky_Ground_and_Big_Waves/6.01%3A_Solid_Rock_and_Bowls_of_Jello/6.1.02%3A_Amplification_of_Seismic_Waves_by_Soft_Surficial_Deposits, accessed September 10, 2025.

or destroy buildings and structures, and may cause partial or total collapse. Ground movement can damage or destroy infrastructure on or beneath the surface, such as roads, rail lines, and utility lines and pipes. This in turn, can cause hazardous materials releases, water main breaks, and other dangerous situations resulting from infrastructure failure. Falling debris and structures also create a risk of injury or death.

LIQUEFACTION

Liquefaction occurs when ground shaking causes saturated soils, primarily clay-free deposits such as sand or silt, to lose strength and act like a viscous fluid. Certain soils are more susceptible to liquefaction, particularly younger and looser sediment closer to the water table. According to FEMA, liquefaction causes three types of ground failure, as described below:

- Lateral spreads involve the lateral movement of large blocks of soil as a result of liquefaction of an underlying layer. They generally develop on gentle slopes, most commonly between 0.3 and 3 degrees. Horizontal movements commonly are as much as 10 to 15 feet. However, where slopes are particularly favorable, and the duration of ground shaking is long, lateral movement may be as much as 100 to 150 feet. Lateral spread usually breaks up internally, forming numerous fissures and scarps.
- Flow failures consist of liquefied soil or blocks of intact material riding on a layer of liquefied soil and are the most catastrophic type of ground failure caused by liquefaction. They commonly move several feet and up to dozens of miles under certain conditions. Flow failures usually form in loose saturated sands or silts on slopes greater than three degrees.
- Loss of bearing strength occurs when the soil supporting buildings or other structures liquefies. When large deformations occur, structures settle and tip. The general subsurface geometry required for liquefaction-caused bearing failures is a layer of saturated, cohesionless soil that extends from near the ground surface to a depth equal to about the width of the building.

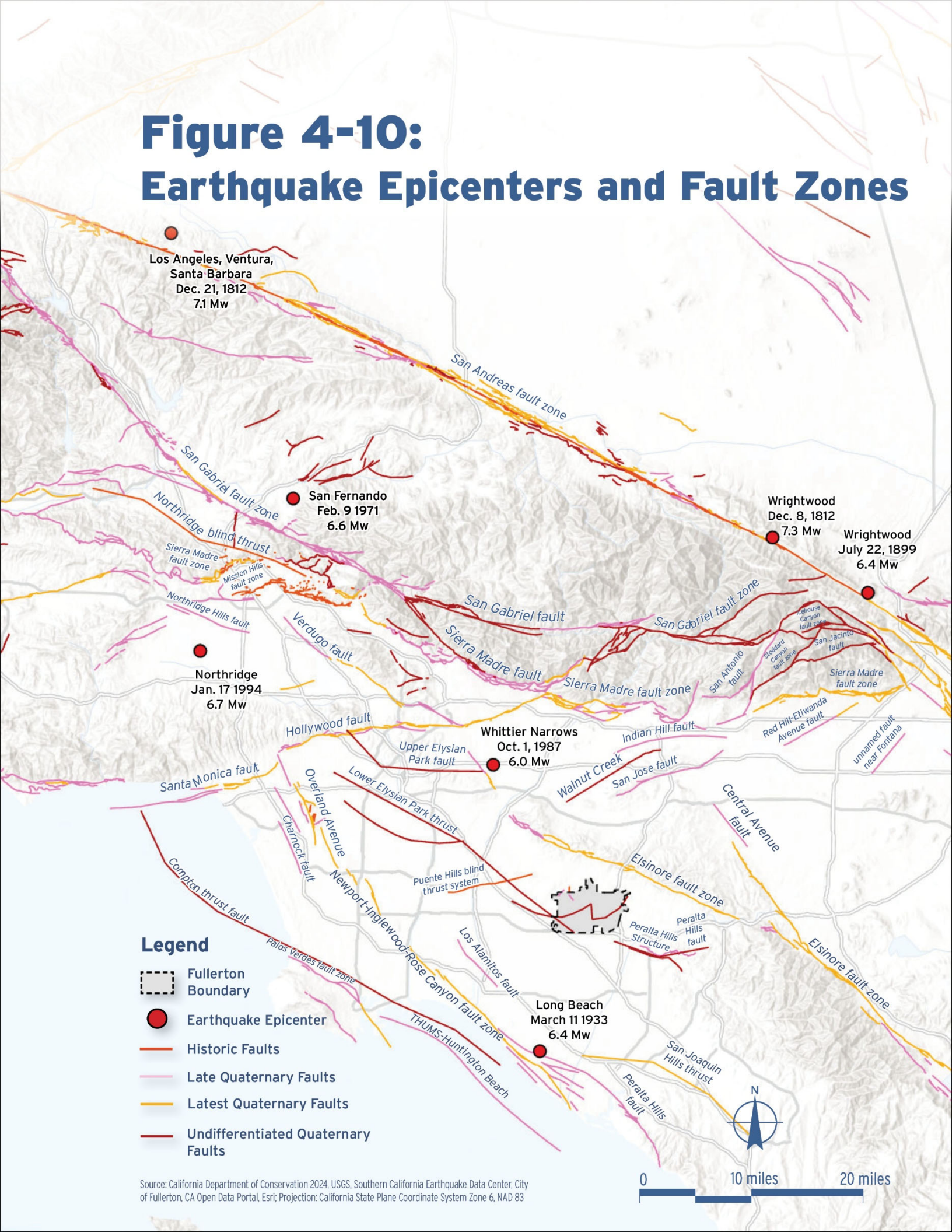
4.9.2 LOCATION/EXTENT

FAULT RUPTURE AND GROUND SHAKING

The City is located within the Southern California region, known to be seismically active. Active faults that are close to the city include the Elsinore Fault, Joaquin Hills Thrust Fault, Newport-Inglewood Fault, San Andreas Fault, and the Peralta Hills Fault. The location of regional faults and big earthquake epicenters in relation to the City are depicted in **Figure 4-10: Earthquake Epicenters and Fault Zones**.

There are two primary fault systems that run through the city, the Puente Hills blind thrust system and the Lower Elysian Park thrust. These are undifferentiated quaternary faults and thus not mapped in the Alquist-Priolo Zone. The faults are the Puente Hills thrust runs east-west through the center of the city and the Lower Elysian Park thrust runs southeast through the southwest corner of the city. **Figure 4-11: Traversing Faults in Fullerton** shows fault systems within the City.

Figure 4-10:
Earthquake Epicenters and Fault Zones



Source: California Department of Conservation 2024, USGS, Southern California Earthquake Data Center, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

Table 4-17: Local Earthquake Faults lists each active and potentially active fault near Fullerton, distance to the City, and estimated magnitude.

TABLE 4-17: LOCAL EARTHQUAKE FAULTS

FAULT NAME	DISTANCE[1] (MILES)	LAST MAJOR RUPTURE	ESTIMATED MAGNITUDE[2]
Puente Hills blind thrust system	Within City Boundaries	Undifferentiated Quaternary (< 1.6 million years)	Unknown
Lower Elysian Park thrust	Within City Boundaries	Undifferentiated Quaternary (< 1.6 million years)	Unknown
Elsinore	2.75	May 15, 1910	6.5-7.5
San Joaquin Hills Thrust	12.0	Latest Quaternary (<15,000 years)	Unknown
Newport-Inglewood	10.2	March 10, 1933	6.0-7.4
Peralta Hills	1.31	Undifferentiated Quaternary (< 1.6 million years)	Unknown
San Andreas	35.0	January 9, 1857	6.8-8.0

[1] Estimated Distance
[2] In Mw (Moment Magnitude)

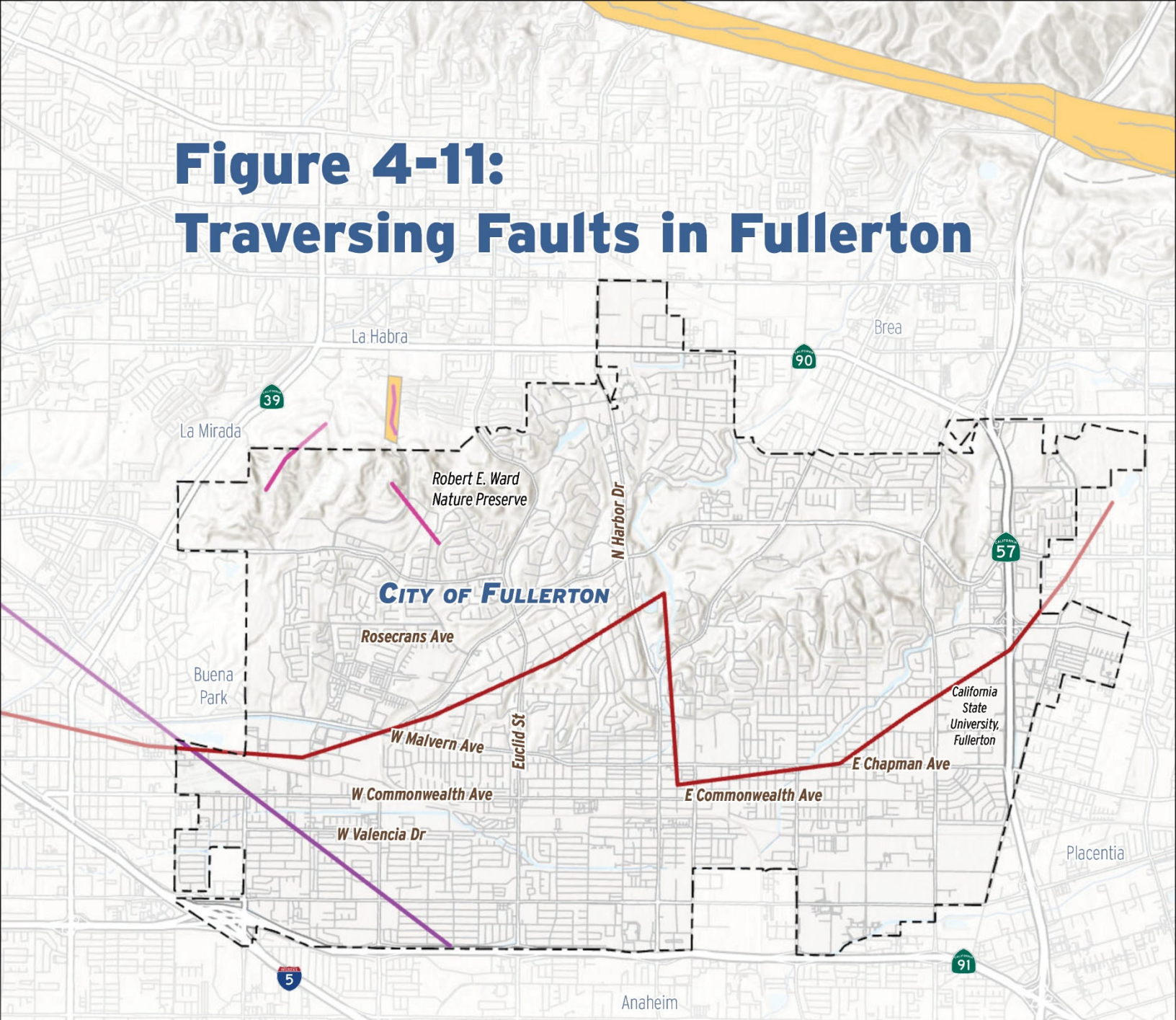
Sources: Southern California Earthquake Data Center, Earthquake Information, https://scedc.caltech.edu/earthquake/faults.html, accessed September 16, 2025.
USGS, Quaternary Fault and Fold Database of the United States, https://earthquake.usgs.gov/cfusion/qfault/show_report_AB_archive.cfm?fault_id=186&section_id=, accessed September 16, 2025.

The list below shows more information on nearby faults. There is limited information on undifferentiated Quaternary faults, however, these may still pose seismic risks despite limited available data. While faults such as the Puente Hills blind thrust system and the Lower Elysian Park thrust do run through the city, they are classified as undifferentiated Quaternary faults, meaning there is limited data available regarding their most recent activity.

- The Elsinore Fault Zone runs from the Chino Hills region to the California-Mexico border, and is approximately 2.75 miles from the City at its closest point. Near Chino Hills it splits into two separate segments, the Chino Fault, and the Whittier Fault. This fault is believed to cause a major event approximately every 250 years with a probable magnitude of 6.5 to 7.5.[64] The last major event along this fault was a 1910 earthquake measuring an estimated 6.0 on the moment magnitude scale.

[64] Southern California Earthquake Data Center, *Elsinore Fault Zone*, https://scedc.caltech.edu/earthquake/elsinore.html, accessed September 16, 2025.

Figure 4-11: Traversing Faults in Fullerton



Legend

City of Fullerton Municipal Boundary

Alquist-Priolo Zone outside of Fullerton

Fault Zones Traversing Fullerton

Puente Hills blind thrust system

Lower Elysian Park thrust

Faults in West Coyote Hills

Faults Outside of Fullerton

0 1 mile 2 miles

N

Source: California Geological Survey 2015, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

- The Newport/Inglewood Fault, a right-lateral fault system, extends along the coast approximately 10.2 miles south of the City. The system is capable of producing a 6.9 magnitude earthquake and has a slip rate of 1mm/yr.[65] The movement on this fault caused the 1933 Long Beach magnitude 6.3 earthquake, and the 1920 Inglewood earthquake (estimated magnitude 4.9). The 1933 earthquake resulted in 120 deaths and over $50 million in property damage.
- The San Andreas Fault, the largest and most well-known of California's faults, runs from Cape Mendocino to the Salton Sea. It is approximately 35 miles from the City at its closest point. It has caused numerous major earthquakes throughout California's history, including the 1906 San Francisco earthquake and the 1989 Loma Prieta earthquake which caused widespread damage in the San Francisco Bay Area. The central portion of the San Andreas Fault was responsible for an earthquake measuring an estimated 7.9 on the moment magnitude scale, the strongest in California's recorded history in 1857 near the town of Parkfield. The Southern California Earthquake Data Center estimates that a future major event along the southern part of the San Andreas Fault could measure 6.8 to 8.0 on the moment magnitude scale. The recurrence interval along the fault varies greatly, from less than 20 years to more than 300 years between events.[66]

Alquist-Priolo earthquake fault zones are regulatory zones surrounding the surface traces of active faults in California as mapped and defined by the California Department of Conservation. The Alquist-Priolo Earthquake Fault Zoning Act is a California law enacted in 1972 to reduce the risk of damage from surface rupture during earthquakes. Under the Alquist-Priolo Act, a fault is considered active if it has shown evidence of surface rupture within the last 11,000 years. The undifferentiated Quaternary faults that run through the City have not ruptured the surface within the last 11,000 years and thus are not classified as active under the Alquist-Priolo Act.

Due to the regional nature of seismic waves, ground shaking from earthquakes can affect large geographic areas well beyond the epicenter. Given that the City of Fullerton is located near several regional fault systems—and even contains fault traces within its boundaries—ground shaking has the potential to impact the entire city. This widespread vulnerability is especially concerning for certain types of structures, including residential buildings made of wood or reinforced masonry, mobile homes, and soft-story buildings. Soft-story buildings, which typically have a ground floor lacking sufficient lateral support due to limited shear walls, are particularly susceptible to damage.

There are two scales commonly used by scientists to measure earthquakes: the Moment Magnitude Scale and the Modified Mercalli Intensity Scale. The moment magnitude scale is based on the now largely unused Richter scale and measures the amount of energy released by the earthquake. The Modified Mercalli Intensity Scale (MMI Scale) measures the effects of

[65] Southern California Earthquake Data Center, *Newport-Inglewood Fault Zone*, https://scedc.caltech.edu/earthquake/newport.html, accessed September 16, 2025.
[66] Southern California Earthquake Data Center, *San Andreas Fault Zone*, https://scedc.caltech.edu/earthquake/sanandreas.html, accessed September 16, 2025.

the earthquake and is based on qualitative observations rather than a mathematical basis. The intensity scale consists of a series of certain key responses such as people awakening from sleep, movement of furniture, damage to chimneys, and destruction. Although numerous scales have been developed to evaluate earthquake effects, the scale currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of twelve increasing levels of intensity ranging from imperceptible shaking to catastrophic destruction, is designated by Roman numerals I through XII. **Table 4-18: Modified Mercalli Intensity Scale** shows the different categories of the Mercalli intensity scale.

TABLE 4-18: MODIFIED MERCALLI INTENSITY SCALE

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
I	Non felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specifically designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS, The Modified Mercalli Intensity Scale, https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects, accessed September 17, 2025.

Magnitude and intensity measure different characteristics of earthquakes but often correlate. Magnitude measures the energy released at the source of the earthquake, determined by measurements on seismographs. Intensity measures the strength of shaking produced by an earthquake at a certain location, and is determined by effects on people, structures, and the natural environment. Refer to **Table 4-19: Approximate Comparison of Moment Magnitude and Mercalli Intensity Scale**, which lists the intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

TABLE 4-19: APPROXIMATE COMPARISON OF MOMENT MAGNITUDE AND MERCALLI INTENSITY SCALE

MOMENT MAGNITUDE	MERCALLI INTENSITY
1.0 to 3.0	I
3.0 to 3.9	II to III
4.0 to 4.9	IV to V
5.0 to 5.9	VI to VII
6.0 to 6.9	VII to IX
7.0 and greater	VIII and greater

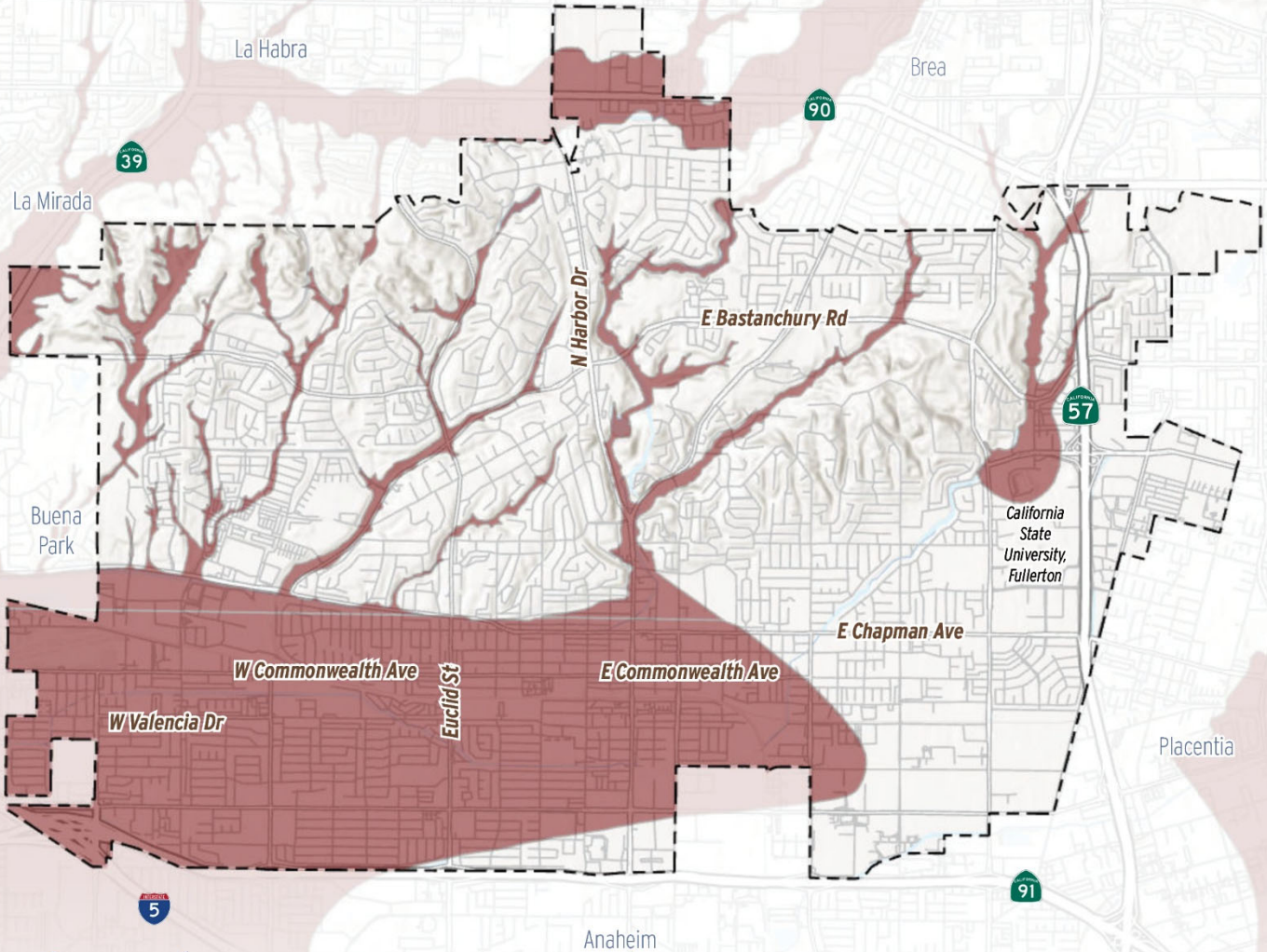
Source: USGS, Magnitude/Intensity Comparison, http://earthquake.usgs.gov/learn/topics/mag_vs_int.php, accessed September 17, 2025.

The City of Fullerton faces considerable seismic risk due to its proximity to several active faults capable of producing earthquakes with estimated Moment Magnitudes of 6.0 and above. Even if an earthquake does not originate within city limits, regional seismic events can still generate intense ground shaking across Fullerton. Such magnitudes are commonly associated with Modified Mercalli Intensity levels that indicate significant structural damage, especially to vulnerable buildings like soft-story structures, older masonry homes, and mobile residences. The impacts of this ground shaking could include widespread damage to infrastructure, disruption of utilities, compromised roadways, and potential collapse of critical facilities. These consequences would severely hinder the city's ability to respond effectively—delaying emergency services, complicating evacuation routes, and straining coordination among agencies. Communication networks may be impaired, emergency shelters overwhelmed, and transportation corridors blocked, all of which would challenge Fullerton's capacity to manage a timely and organized disaster response.

LIQUEFACTION

The potential for liquefaction exists in areas susceptible to ground shaking where loose, unconsolidated soils and shallow groundwater are present. In Fullerton, this risk is heightened by the presence of active regional faults, geologically young sediments, groundwater, various valleys and creek beds. The California Geological Survey Seismic Hazard Zonation Program identifies and maps areas prone to liquefaction; refer to **Figure 4-12: Liquefaction Hazard Zone**.

Figure 4-12: Liquefaction Hazard Zone



Legend

City of Fullerton Municipal Boundary

Liquefaction Hazard Zone

0 1 mile 2 miles

N

Source: California Geological Survey (CGS) Seismic Hazards Program 2017, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

Notably, the Orange County Groundwater Basin underlies much of the city, particularly in its southern portions, linked to groundwater levels that increase liquefaction susceptibility. Liquefaction hazard zones are concentrated in the following key areas: the south and southwest portions of the city, where low elevation and the groundwater basin converge; central valleys throughout the city, including areas surrounding Brea Creek, Fullerton Creek, and the Brea and Fullerton Dams; and the northernmost portion of the city near Imperial Highway. These areas align with zones identified by the California Geological Survey's Seismic Hazard Zonation Program.

Liquefaction-prone zones in Fullerton underlie a diverse mix of land uses—including residential neighborhoods, commercial centers, and industrial facilities—making the potential impacts both widespread and severe. During a strong earthquake, saturated soils in these areas may lose strength and behave like a liquid, causing buildings to tilt, sink, or collapse, and underground utilities to rupture. In residential zones, this could result in extensive damage to homes, displacement of residents, and disruption of essential services. Commercial and industrial areas may experience structural failures, inventory losses, and hazardous material spills, especially where heavy equipment or storage tanks are present. Roadways, bridges, and rail lines crossing liquefaction zones could buckle or become impassable, impeding emergency response, evacuation efforts, and coordination among city departments. The cumulative effect would be a significant strain on Fullerton's ability to maintain public safety, restore infrastructure, and resume normal operations in the aftermath of a major seismic event.

4.9.3 PREVIOUS OCCURRENCES

FAULT RUPTURE AND GROUND SHAKING

As discussed above, a variety of faults are located near the City of Fullerton. **Table 4-20: Major Earthquake Faults of Particular Concern** identifies faults of concern within the region and their last major ruptures.

TABLE 4-20: MAJOR EARTHQUAKE FAULTS OF PARTICULAR CONCERN

FAULT NAME	TYPE OF FAULTING	LAST MAJOR RUPTURE	SLIP RATE	INTERVAL BETWEEN RUPTURES	ESTIMATED MAGNITUDE
Puente Hills blind thrust system	Thrust	Undifferentiated Quaternary (< 1.6 million years)	Between 0.2 and 1.0 mm/yr	Unknown	Unknown
Lower Elysian Park thrust	Thrust	Undifferentiated Quaternary (< 1.6 million years)	Between 1.0 and 5.0 mm/yr	Unknown	Unknown
Elsinore	Right-lateral strike-slip	May 15, 1910, Magnitude 6 – no surface rupture	Roughly 4.0 mm/yr	Roughly 250 years	6.5 - 7.5 Mw
San Joaquin Hills Thrust	Thrust	Latest Quaternary (<15,000 years)	Between 0.2 and 1.0 mm/yr	Unknown	Unknown
Newport-Inglewood	Right-lateral	March 10, 1933	0.6 mm/yr	Unknown	6.0-7.4

FAULT NAME	TYPE OF FAULTING	LAST MAJOR RUPTURE	SLIP RATE	INTERVAL BETWEEN RUPTURES	ESTIMATED MAGNITUDE
	reverse slip				
Peralta Hills	Reverse	Undifferentiated Quaternary (< 1.6 million years)	Unknown	Unknown	Unknown
San Andreas	Right-lateral strike-slip	January 9, 1857	20 to 35 mm/year	Roughly 140 years	6.8-8.0

mm = millimeters, yr = year, Mw = Moment Magnitude

Source: Southern California Earthquake Center, Significant Earthquakes and Faults, http://scedc.caltech.edu/significant/fault-index.html, accessed September 19, 2025. USGS, Quaternary Fault and Fold Database of the United States, https://earthquake.usgs.gov/cfusion/qfault, accessed September 19, 2025.

Table 4-21: Significant Historical Earthquakes in Southern California and **Figure 4-10** above identifies the major earthquakes that have occurred in southern California. As shown in **Table 4-21**, multiple regional major earthquakes over the past two decades have resulted in seismic ground shaking in Fullerton.

TABLE 4-21: SIGNIFICANT HISTORICAL EARTHQUAKES IN SOUTHERN CALIFORNIA

EARTHQUAKE NAME	YEAR	ESTIMATED MAGNITUDE
Los Angeles, Ventura, Santa Barbara	1812	7.1 Mw
Wrightwood	1812	7.3 Mw
Wrightwood	1899	6.4 Mw
Elsinore	1910	6.0 Mw
San Jacinto	1918	6.8 Mw
North San Jacinto	1923	6.3 Mw
Long Beach	1933	6.4 Mw
San Fernando	1971	6.6 Mw
Whittier Narrows	1987	6.0 Mw
Newport Beach	1989	4.7 Mw
Northridge	1994	6.7 Mw
Yorba Linda	2002	4.6 Mw
Chino Hills	2008	5.4 Mw

Source: Southern California Earthquake Data Center, Significant Earthquakes and Faults, https://scedc.caltech.edu/earthquake/significant.html, accessed September 19, 2025.

The Yorba Linda and Chino Hills Earthquakes are the two most recent earthquakes in close proximity to the City. On September 3, 2002, a 4.8 magnitude earthquake occurred at midnight northeast of Fullerton in the Chino Hills area. The epicenter of the quake occurred at the foot of the Gilman Peak in Telegraph Canyon. It was widely felt in the epicentral region and as far away as San Diego, Palm Springs, Barstow, and Mojave. Although the ground motion earthquake was noticed by residents, it did not result in any major injuries or structural

damage.[67] On July 29, 2008, a 5.4 magnitude earthquake started 2 miles southwest of Chino Hills, in the Chino Hills State Park. Seismic ground shaking reached a magnitude of VI on the Modified Mercalli Intensity and the resulting ground motion resulted in structural damage to three residences within the neighboring City of Yorba Linda.[68]

No federally declared disasters relating to fault rupture and ground shaking have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

LIQUEFACTION

Comprehensive, historic accounts of liquefaction-related damage within the City of Fullerton are limited. The Orange County and Orange County Fire Authority Local Hazard Mitigation Plan does not document any confirmed liquefaction incidents occurring in Fullerton in recent history. City staff have not reported specific recollections of past liquefaction events. However, regional seismic activity—particularly the 1987 Whittier Narrows Earthquake—highlighted susceptibility to liquefaction in areas underlain by young alluvial sediments and shallow groundwater, including zones along the Santa Ana River and other low-lying creek beds.[69]

In Fullerton, the California Geological Survey's Seismic Hazard Zonation Program identifies several areas as having a high potential for liquefaction during strong ground shaking. These include the southern and southwestern portions of the city, central valleys near Brea Creek and Fullerton Creek, and the northernmost areas near Imperial Highway. While no documented damage has occurred in these zones to date, their geological characteristics and proximity to active faults suggest that future seismic events could trigger liquefaction, posing significant risks to infrastructure, residential neighborhoods, and commercial operations.

No federally declared disasters relating to liquefaction have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

4.9.4 PROBABILITY OF FUTURE OCCURRENCES

FAULT RUPTURE AND GROUND SHAKING

Given the location of the planning area, the presence of several local/regional faults, and previous occurrences, it has been determined that the probability of ground shaking impacting the planning area in the future is considered highly likely. A highly likely probability means there is a 90 to 100 percent probability of occurrence in the next year or a recurrence

---

[67] Los Angeles Times, *Magnitude 4.8 Quake Rattles the Southland*, https://www.latimes.com/archives/la-xpm-2002-sep-04-me-quake4-story.html, accessed September 22, 2025.
[68] Los Angeles Times, *3 Yorba Linda homes more than shaken by quake*, https://www.latimes.com/local/la-me-yorbaquake31-2008jul31-story.html, accessed September 22, 2025.
[69] Los Angeles Times, *The Earthquake in Orange County: Warning: Soil Could Turn to Mush in a Strong Earthquake*, https://www.latimes.com/archives/la-xpm-1987-10-03-me-2848-story.html, published October 3, 1987, accessed September 19, 2025.

interval of less than one year. The LHMP planning team assigned a high hazard planning consideration to the hazards and impacts associated with ground shaking based upon a likely probability and expected impacts of future events.

The USGS Uniform Earthquake Rupture Forecast Version 3 released in 2017 provides a perspective of the likelihood each California region will experience a magnitude 6.7 or larger earthquake in the next 30 years; refer to **Table 4-22 Likelihood of One or More Earthquakes Occurring in the Next 30 Years in Orange County Region by Fault**. Likelihood of occurrence of for the local undifferentiated quaternary faults are not included, however probability for major earthquake faults in the region are provided. The Elsinore and Newport/Inglewood faults, shows lower probabilities for an earthquake greater than 6.7 M in the next 30 years compared to the San Andreas Fault. It is noted that while less likely, an earthquake on the nearby Elsinore Fault would have the highest probability for strong ground shaking within the City.

TABLE 4-22: LIKELIHOOD OF ONE OR MORE EARTHQUAKES OCCURRING IN THE NEXT 30 YEARS IN ORANGE COUNTY REGION BY FAULT

MAGNITUDE	ELSINORE FAULT	NEWPORT/INGLEWOOD FAULT	SAN ANDREAS
M ≥ 6.7	3.66%	0.95%	19.21%
M ≥ 7.0	1.82%	0.81%	12.86%
M ≥ 7.5	0.90%	0.42%	10.21%
M ≥ 8.0	<0.01%	--	3.24%

[1] M≥6.7 means magnitude greater than or equal to 6.7, and likewise for the other magnitude thresholds.
[2] The 30-year period measured by this report is 2014 to 2044; a 30-year period is the typical duration of a homeowner mortgage.
[3] Percentages for fault sections closest to the City.
Source: U.S. Department of the Interior and U.S. Geological Survey, The Third California Earthquake Rupture Forecast (UCERF3), March 2015.

LIQUEFACTION

Because several areas in Fullerton are located within identified liquefaction hazard zones the likelihood of future liquefaction occurrences is considered highly likely. These zones are characterized by low elevation, unconsolidated sediments, and shallow groundwater levels, especially where the Orange County Groundwater Basin underlies the city. Liquefaction should be expected and anticipated as a secondary hazard resulting from seismic activity in the region.

Liquefaction would only be triggered by a significant earthquake event occurring on or near one of the fault zones close to Fullerton. The undifferentiated quaternary faults within and near the City, as well as the regional Elsinore and Newport/Inglewood faults, have a limited probability of producing a magnitude 6.7 or greater earthquake within the next 30 years. This reduces the probability of liquefaction resulting from seismic activity on this fault. However, earthquakes are more probable on the San Andreas fault system, which is located farther from the planning area. Depending on the epicenter location, depth, and magnitude of such an event, ground shaking may or may not be sufficient to trigger liquefaction within Fullerton's jurisdiction.

Given the location of the planning area, the presence of several local and regional faults, and limited recent impacts, it has been determined that the probability of liquefaction impacting

the City of Fullerton in the future is considered highly likely. A highly likely probability means there is a 90 to 100 percent chance of occurrence in the next year or a recurrence interval of less than one year. The LHMP planning team assigned a high hazard planning consideration to the hazards and impacts associated with liquefaction based upon this probability and the expected impacts of future events.

4.9.5 CLIMATE CHANGE

FAULT RUPTURE & GROUND SHAKING

Both fault rupture and ground shaking are caused by seismic activity, which is not correlated with climate change. Thus, fault ruptures or ground shaking is not more likely to occur as climate change impacts become more significant.

LIQUEFACTION

Climate change may increase susceptibility to liquefaction. Climate change is likely to bring more severe rain events to southern California, increasing the amount of water saturation in loose soils. Saturated soils are known to be at risk for liquefaction or ground failure in an earthquake. Thus, heavy periods of rain combined with a local earthquake with strong ground shaking could increase the likelihood of liquefaction potential.

4.9.6 VULNERABILITY ASSESSMENT

FAULT RUPTURE AND GROUND SHAKING

Although no Alquist-Priolo fault zones traverse the City of Fullerton, nearby and regional faults—including mapped Quaternary faults—pose a credible threat of fault rupture and ground shaking. Given the proximity of these fault systems and the unpredictable nature of seismic activity, a conservative planning approach assumes that the entire City is potentially vulnerable to earthquake-related hazards. This includes all 167 critical facilities, 69 facilities of concern, 47,484 occupied residential units, and the full population of 141,278 residents.

Ground shaking is expected to be the most widespread and damaging effect of a seismic event. Older buildings and infrastructure may be especially susceptible to collapse or structural failure. Bridges and highways could be compromised, isolating neighborhoods and delaying emergency response. Underground systems such as water mains, gas lines, and sewer networks may rupture, leading to flooding, contamination, fires, and service outages. Fault rupture, while more localized, could cause severe damage to structures and infrastructure directly overlying or adjacent to fault lines, including facilities that provide power, transportation, and emergency services.

Damage to critical facilities—such as police and fire stations, water and energy utilities, and transportation infrastructure—could significantly hinder City operations and emergency response capabilities. Facilities of concern, including schools and healthcare centers, may face evacuation challenges and safety risks. Residential areas could experience displacement, injury, or loss of life, particularly in densely populated or structurally vulnerable neighborhoods.

Given the potential for widespread disruption and cascading impacts, it is essential to incorporate seismic hazard mitigation strategies that strengthen infrastructure, protect vulnerable populations, and ensure continuity of essential services across Fullerton.

LIQUEFACTION

To identify populations at risk for liquefaction hazards, liquefaction hazard data layers from the California Geological Survey were overlaid and compared with City parcel data in Geographic Information Systems, ArcGIS. If a hazard layer either completely or partially overlapped with a parcel in the data layer, then the entire parcel is conservatively considered vulnerable in this analysis. In many instances, the liquefaction hazard zone intersected with only small portions of individual properties. However, to provide a detailed understanding of risk and vulnerability as part of this hazard mitigation plan, these parcels (including all residential and non-residential development on the parcel, regardless of location) are considered vulnerable.

Liquefaction hazard zones in the City of Fullerton are primarily concentrated in the southwestern portion of the City, as well as along creeks, valleys, and other low-lying areas where the water table is shallow or near the surface. These mapped zones indicate a significant vulnerability to ground failure during seismic events, particularly in areas with saturated soils. A detailed inventory of vulnerable assets is provided in **Table 4-23: Critical Facilities and Facilities of Concern Vulnerable to Liquefaction**, which lists the critical facilities and facilities of concern located within the liquefaction hazard zone.

Table 4-23: Critical Facilities and Facilities of Concern Vulnerable to Liquefaction

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
Critical Facilities			
1	City Hall	City Hall	$7,276,800
2	City Yard	Municipal Government	Not Available
3	Fire Station 1	Fire Station	$1,630,720
4	Fire Station 2	Fire Station	$1,630,720
7	Fire Station 5	Fire Station	$1,630,720
8	Fire Station 6	Fire Station	$1,630,720
9	Police Station	Police Station	$1,630,720
11	Maple Community Center	Community Center	$3,312,650
12	Richman Community Center	Community Center	$3,312,650
13	Main Library	Library	Not Available
14	Gilbert Community Center	Community Center	$3,312,650
15	Amerige Park	Park	Not Available
17	Fullerton Museum Center	Museum	$3,312,650
19	Fullerton Community Center	Community Center	$3,312,650
20	Fullerton Tennis Center	Sports Center	Not Available
21	Independence Park	Park	Not Available
22	Laguna Lake Park	Park	Not Available
23	Fullerton Airport	Airport	$14,306,673
24	Transportation Center	Transportation Center	Not Available

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
25	Bridge 55C0147	Bridge	Assumed $583/SF
26	Bridge 55C0290	Bridge	Assumed $583/SF
27	Bridge 55C0292	Bridge	Assumed $583/SF
28	Bridge 55C0288	Bridge	Assumed $583/SF
29	Bridge 55C0293	Bridge	Assumed $583/SF
30	Bridge 55C0291	Bridge	Assumed $583/SF
31	Bridge 55C0224	Bridge	Assumed $583/SF
32	Bridge 55C0228	Bridge	Assumed $583/SF
33	Bridge 55C0226	Bridge	Assumed $583/SF
34	Bridge 55C0225	Bridge	Assumed $583/SF
35	Bridge 55C0227	Bridge	Assumed $583/SF
36	Bridge 55C0229	Bridge	Assumed $583/SF
37	Bridge 55C0386	Bridge	Assumed $583/SF
38	Bridge 55C0230	Bridge	Assumed $583/SF
39	Bridge 55C0120	Bridge	Assumed $583/SF
41	Bridge 55C0289	Bridge	Assumed $583/SF
42	Bridge 55C0602	Bridge	Assumed $583/SF
45	Bridge 55C0233	Bridge	Assumed $583/SF
46	Bridge 55C0231	Bridge	Assumed $583/SF
47	Bridge 55C0235	Bridge	Assumed $583/SF
48	Bridge 55C0294	Bridge	Assumed $583/SF
49	Bridge 55C0243	Bridge	Assumed $583/SF
50	Bridge 55C0242	Bridge	Assumed $583/SF
51	Bridge 55C0244	Bridge	Assumed $583/SF
52	Bridge 55C0234	Bridge	Assumed $583/SF
53	Bridge 55C0418	Bridge	Assumed $583/SF
61	Bridge 55C0384	Bridge	Assumed $583/SF
62	Bridge 55C0308	Bridge	Assumed $583/SF
63	Bridge 55C0236	Bridge	Assumed $583/SF
65	Bridge 55C0232	Bridge	Assumed $583/SF
66	Bridge 55C0263	Bridge	Assumed $583/SF
67	Bridge 55C0585	Bridge	Assumed $583/SF
68	Bridge 55C0310	Bridge	Assumed $583/SF
69	Bridge 55C0311	Bridge	Assumed $583/SF
70	Bridge 55C0312	Bridge	Assumed $583/SF
71	Bridge 55C0664	Bridge	Assumed $583/SF
72	Bridge 55C0383	Bridge	Assumed $583/SF
73	Bridge 55C0385	Bridge	Assumed $583/SF
74	Bridge 55C0309	Bridge	Assumed $583/SF
75	Bridge 55C0307	Bridge	Assumed $583/SF
76	Bridge 55C0295	Bridge	Assumed $583/SF
77	Bridge 55C0525	Bridge	Assumed $583/SF
86	Hawks Pointe Reservoir	Reservoir	$1,500,000
87	Hermitage Pump Station (1)	Pump Station	$525,000
88	Hermitage Pump Station (2)	Pump Station	$525,000
89	Hermitage Pump Station (3)	Pump Station	$525,000

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
90	Hermitage Pump Station (4)	Pump Station	$525,000
92	Hermitage Reservoir	Reservoir	$1,500,000
134	Kimberly Well 1A PFAS Water Treatment Plant	Water Treatment Plant	$720,000,000
Facilities of Concern			
1	Buena Park High School	Education	$72,097,328
2	Fullerton Union High School	Education	$57,867,998
13	Robert C. Fisler School	Education	$14,367,891
18	Maple Elementary School	Education	$8,418,496
19	Nicolas Junior High School	Education	$20,041,754
20	Orangethorpe Elementary School	Education	$16,034,073
21	Pacific Drive Elementary School	Education	$14,410,425
24	Richman Elementary School	Education	$19,184,566
26	Sunset Lane Elementary School	Education	$14,900,306
27	Valencia Park Elementary School	Education	$16,754,018
28	Woodcrest Elementary School	Education	$16,095,256
32	Marshall B. Ketchum University	Education	Not Available
36	Kids Adventure Learning Center	Education	Not Available
39	Arborland Montessori School - Valencia Campus	Education	Not Available
42	Eastside Christian	Education	Not Available
44	James A. Whitaker Elementary	Education	$16,455,229
46	Sunrise of Fullerton	Healthcare/Assisted Living Facility	$6,536,250.00
50	Fullerton Rosewood Assisted	Healthcare/Assisted Living Facility	$6,536,250.00
53	Applecrest Homes Assisted Living	Healthcare/Assisted Living Facility	$6,536,250.00
55	D'Best Care Board and Care	Healthcare/Assisted Living Facility	$6,536,250.00
56	Senior Living Community	Healthcare/Assisted Living Facility	$6,536,250.00
57	Cherub Home	Healthcare/Assisted Living Facility	$6,536,250.00
59	Kindred Hospital Brea - Subacute	Healthcare/Assisted Living Facility	$6,536,250.00
63	Windsor Garden of Fullerton	Healthcare/Assisted Living Facility	$6,536,250.00
67	Santa Ana Armory Cold Weather Shelter	Community Services	$6,536,250.00

A total of 68 critical facilities are located within these zones, including municipal buildings, police and fire stations essential for emergency response, community centers that may serve as emergency staging areas or gathering places, transportation infrastructure such as bridges,

water system components including pump stations and reservoirs, and one water treatment plant. Additionally, 25 facilities of concern are situated within liquefaction-prone areas, primarily consisting of schools, healthcare and assisted living facilities, and other community services that support residents.

Additionally, approximately 32,779 residential units are located within the liquefaction hazard zone. The vulnerability assessment cross-referenced hazard layers with parcel data layers in GIS. The number of vulnerable residential units multiplied by the average of 2.91 persons per household for Fullerton indicates that approximately 95,387 people reside in the landslide hazard zone. Approximately 343,711,021 square feet of non-residential structures are located within the liquefaction hazard area. Refer to **Table 4-24: Populations at Risk for Liquefaction** for a summary of vulnerable residents, residential units, and non-residential buildings.

TABLE 4-24: POPULATIONS AT RISK FOR LIQUEFACTION

RESIDENTS AT RISK	RESIDENTIAL UNITS AT RISK	NON-RESIDENTIAL AREA AT RISK (SQ.FT.)
95,387 residents	32,779 residential units	343,711,021 sq. ft.

Liquefaction may cause severe damage to residential and commercial structures, leading to foundation failures and building collapses. With residential units and residents located within the hazard zone, the potential for displacement and property loss is substantial. Critical facilities and facilities of concern may become unsafe or unusable, disrupting essential services such as emergency response, shelter, water delivery, and public safety. Water service infrastructure may be compromised, resulting in broken pipelines and loss of water supply. Transportation infrastructure, including roads and bridges, could suffer significant damage, hindering travel and emergency operations. These impacts could severely disrupt the City's ability to coordinate emergency response and evacuations, leaving residents with prolonged utility outages, limited access to essential services, and increased risk during emergencies.

4.9.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Since the 2020 LHMP, the City of Fullerton has experienced marginal population growth and moderate increases in housing development, primarily through residential infill, mixed-use redevelopment, and rehabilitation of existing structures. Although faults run through the City, they are not classified as active Alquist-Priolo Zone faults. Nonetheless, Fullerton remains susceptible to ground shaking from regional seismic activity, and for planning purposes, the entire city is considered potentially vulnerable to fault rupture and ground shaking. Therefore, all development and population growth over the past five years—regardless of location—has contributed to a slight increase in seismic vulnerability. Additionally, some of this development may have occurred within mapped liquefaction zones, which are distributed throughout the city, further elevating exposure to seismic hazards.

Looking ahead, Fullerton is expected to accommodate significant residential growth to meet its RHNA allocation of 13,209 housing units by 2029. Much of this development is anticipated within the HIOZ, which includes 759 parcels concentrated along Commonwealth Avenue, South Harbor Boulevard, East Valencia Drive, and other corridors. These areas are located in

the southern and southwestern portions of the city, where liquefaction zones are most prominent. Additional liquefaction zones are mapped in the northernmost part of Fullerton, which includes industrial and commercial land uses that may be redeveloped under the HIOZ program. Furthermore, a liquefaction zone is located just north of California State University, Fullerton, where future student housing and higher-density residential development may occur. Because the entire city is considered vulnerable to fault rupture and ground shaking, and several planned development areas coincide with mapped liquefaction zones, seismic vulnerability is expected to increase moderately over the next five years.

In summary, seismic vulnerability in Fullerton has increased slightly over the past five years due to modest development and population growth across areas potentially affected by ground shaking and liquefaction. Future development—particularly within the HIOZ and near CSU Fullerton—is expected to occur in areas mapped for liquefaction and will contribute to a more notable rise in exposure. As Fullerton continues to grow, it is essential that new development incorporate seismic design standards and geotechnical evaluations to mitigate risks associated with fault rupture, ground shaking, and liquefaction.

4.9.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area, including older adults, individuals with disabilities, linguistically isolated households, and residents in multi-unit, crowded households or group housing. Seismic hazards in the City of Fullerton include fault rupture, ground shaking, and liquefaction. Fault rupture and ground shaking are non-mapped hazards that could affect the entirety of the City; liquefaction is a mapped hazard with zones extending throughout Fullerton and concentrated in the southern and southwestern regions. These liquefaction zones notably overlap with Census Tracts 001404, 001801, 001802, 086701, 011000, 001902, 011601, 011602, 011403, and 011504—representing all but two of the officially designated census tracts with high concentrations of individuals with AFN or limited adaptive capacity. These populations may be particularly vulnerable to seismic hazards due to a range of physical, social, and economic vulnerabilities.

Older adults and individuals with disabilities may face significant challenges during and after seismic events. Ground shaking and fault rupture can cause structural damage, disrupt utilities, and block access routes, making evacuation or sheltering-in-place difficult for those with mobility limitations or chronic health conditions. Liquefaction can further destabilize foundations and roadways, increasing the risk of injury and isolation. Linguistically isolated households may not receive or understand emergency alerts, evacuation instructions, or post-disaster recovery information. Language barriers can hinder evacuation orders and emergency response instructions, leading to delays and increased risk during evacuations. Residents in multi-unit, crowded households or group quarters are at elevated risk due to building vulnerabilities, limited escape routes, and potential delays in emergency response. Liquefaction-prone areas may experience disproportionate structural damage, compounding the challenges for these populations in securing temporary shelter or accessing medical care.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation

Actions ##1, 3, 11, 18, 51, 53 and 54 with these groups in mind, including efforts to strengthen seismic resilience in vulnerable housing stock, improve multilingual emergency communications, and ensure continuity of care and access to emergency services for AFN populations during and after seismic events.

4.10 WILDFIRE AND URBAN FIRE

4.10.1 DESCRIPTION

WILDFIRE

Fire is an integral component of many of California's ecosystems. However, uncontrolled fire hazards threaten lives, property, and natural resources and also present a considerable risk to vegetation and wildlife habitat. Fires occur in wildland and urban areas. A wildland fire is a large destructive fire that can spread quickly over woodland or brush. A wildfire is an uncontrolled fire spreading through vegetative fuels. Wildfires can be caused by human error (such as campfires), intentionally by arson, by mechanical sources of ignition (such as heaters and generators), and by natural events (such as lightning). Wildfires often occur in forests or other areas with ample vegetation. In areas where structures and other human development meets or intermingles with wildland or vegetative fuels (referred to as the wildland urban interface), wildfires can cause significant property damage and present extreme threats to public health and safety.

There are three categories of interface fire: the classic wildland urban interface exists where well-defined urban and suburban development presses up against open wildland areas; the mixed wildland urban interface is characterized by isolated homes, subdivisions and small communities situated predominantly in wildland settings; and the occluded wildland urban interface exists where islands of wildland vegetation occur inside a largely urbanized area. The wildland-urban interface is present in the eastern inland portion of the City.

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

Southern California faces challenges with wildfire hazards from the increasing number of houses being built in the wildland-urban interface. Every year the growing population has expanded further and further into the hills and mountains, including into brush and forest lands. The increased "interface" between urban/suburban areas and the open spaces created by this expansion has produced a significant increase in threats to life and property from fires and has pushed existing fire protection systems beyond original or current design and capability.

The Santa Ana winds can also further exacerbate wildfires. Santa Ana winds ranging from 45 to 100 mph push dry air from the inland deserts of California and the Southwest over the mountains that lie between these desert areas and coastal California. The Santa Ana winds

also remove moisture in the air resulting in evaporation and dry vegetation. Dry vegetation acts as a fuel for wildfires to grow, with the strong Santa Ana winds driving wildfire spread.

URBAN FIRE

Urban fires refer to structural fires that occur within developed areas, typically involving residential, commercial, industrial, or public buildings. Unlike wildfires, which spread through vegetation and open land, urban fires are confined to the built environment and are often triggered by human activities, electrical faults, gas leaks, or accidents. In cities like Fullerton, the density of structures and population increases the potential for rapid fire spread, property damage, and threats to life safety. These fires can overwhelm emergency response systems, disrupt essential services, and result in significant economic losses.

The impacts of urban fires could particularly affect older buildings, high-density housing, and commercial zones. Fires in these cases may lead to displacement of residents, loss of historic structures, and interruption of business operations. Additionally, urban fires can strain local infrastructure, such as water supply and transportation networks, and pose environmental risks through the release of toxic smoke and debris.

Urban fires may also be exacerbated by other hazards common to Southern California. For example, Santa Ana Winds can intensify fire behavior by rapidly spreading flames and embers across rooftops and through densely packed neighborhoods. While wildfires typically originate in wildland areas, embers carried by these winds can ignite urban fires at the wildland-urban interface or within city limits. Earthquakes, another regional hazard, may also trigger urban fires by damaging gas lines or electrical systems.

4.10.2 LOCATION/EXTENT

WILDFIRE

The California Department of Forestry and Fire Protection (CAL FIRE) prepares wildfire hazard severity maps, including mapping areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies and influence development. While FHSZ do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore, are of greater concern for mitigation purposes.

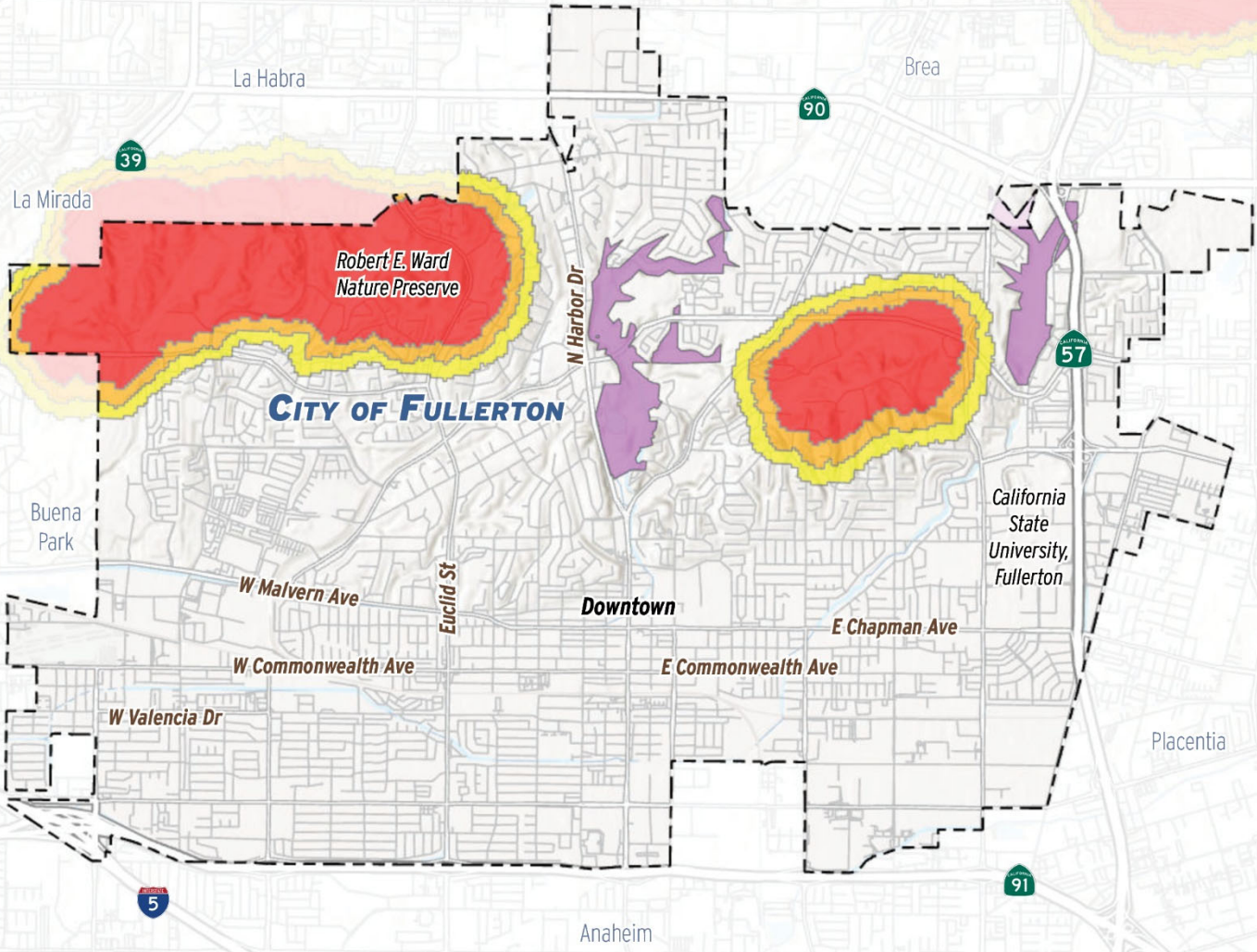
Zones are designated on varying degrees from moderate, high, and very high. There are three types of responsibility areas that FHSZ may fall under: Local Responsibility Area (LRA), State Responsibility Area (SRA), or Federal Responsibility Area (FRA). LRAs are incorporated cities, urban regions, and agriculture lands where the local government is responsible for wildfire protection. SRAs are those which the State of California is financially responsible for the prevention and suppression of wildfires. FRAs are lands on which neither the State nor the local government has legal responsibility for providing fire protection.

Figure 4-13: Fire Hazard Severity Zones shows the responsibility areas and the FHSZs for the City of Fullerton.

The City of Fullerton is primarily designated as LRA, meaning that wildfire protection and mitigation efforts is under the jurisdiction of the City. However, there are two distinct areas within Fullerton that are classified as FRA, where federal agencies are responsible for fire protection. The first FRA is located north of the Brea Dam in the central part of the city and includes Brea Dam, Brea Dam Park, Brea Creek, the Fullerton Sports Complex, and the Fullerton Golf Course. The second FRA is situated in the northeast portion of the city and encompasses Fullerton Dam and Craig Regional Park. Notably, neither of these FRA-designated areas fall within mapped FHSZ, indicating a lower relative risk of wildfire hazard based on CAL FIRE's criteria.

Within Fullerton, Very High Fire Hazard Severity Zones (VHFHSZ) are concentrated in two key areas. The first is the Robert E. Ward Nature Preserve, located at the northwestern boundary of the city. This large greenbelt area, along with adjacent residential neighborhoods, is designated as VHFHSZ, with surrounding zones of high and moderate fire hazard severity. The second VHFHSZ is in the northeast portion of Fullerton and includes the Panorama Nature Preserve and the Coyote Hills Golf Course—another greenbelt concept area—along with nearby residential land uses. These areas are particularly vulnerable due to their proximity to natural vegetation and open space, which can serve as fuel for fires. The presence of high and moderate severity zones around these VHFHSZs underscores the need for targeted mitigation strategies and community preparedness in these parts of the city.

Figure 4-13: Fire Hazard Severity Zones



Legend

- City of Fullerton Municipal Boundary
- Federal Responsibility Area (FRA)

Local Responsibility Area (LRA)
Fire Hazard Severity Zones

- Very High
- High
- Moderate

0 — 1 mile — 2 miles

N

Source: Cal Fire LRA March 24, 2025, Cal Fire FRA June 12, 2017, City of Fullerton, CA Open Data Portal, Esri; Projection: California State Plane Coordinate System Zone 6, NAD 83

The magnitude and severity of wildfire impacts can vary significantly, based on size, scale and location of the fire. Wildfires are not measured on a specific scale and are usually classified by size or impact. The size and severity of any fire depends on the availability of fuel, weather conditions, and topography, although wildfires in the wildland urban interface do not need to be significant in acreage to be damaging. Small fires in Orange County history have been known to cause significant property damage or loss of human life.

Fire protection challenges occur where development is located within and directly adjacent to wildland urban interface areas, thus increasing the extent of the hazard. As the number of structural features increases, so does the risk of incidence of fire. Due to the location of development within and adjacent to the VHFHSZ, there is the potential for a wildfire to spread quickly within the City, depending on the conditions and nature of the fire.

URBAN FIRE

Urban fire risk in Fullerton is considered citywide due to the nature of how these fires originate and spread. Unlike wildfire hazards, which are mapped based on terrain, vegetation, and weather conditions, urban fires can start anywhere within the built environment—making every structure, whether residential, commercial, industrial, or public, potentially vulnerable. Because ignition sources such as electrical faults, cooking accidents, or mechanical failures are not geographically limited, the entire city is potentially susceptible to urban fire. Areas adjacent to mapped Fire Hazard Severity Zones, particularly those near greenbelt areas like the Robert E. Ward Nature Preserve and Panorama Nature Preserve, may face elevated risk due to the potential for fire to spread from wildland areas into urban neighborhoods.

There is no specific scale of measurement for fires apart from the destruction they cause (acres burned, structures razed, injuries, deaths, cost of damage, etc.). The extent and magnitude of urban fire impacts in Fullerton can vary widely depending on the location, density of development, and effectiveness of emergency response. A single structural fire can result in significant property damage, displacement of residents, business interruption, and even loss of life. In densely populated or older parts of the city, fires may spread more rapidly due to building proximity and outdated infrastructure. Urban fires also pose secondary risks, such as compromised air quality, traffic disruptions, and strain on public safety resources.

4.10.3 PREVIOUS OCCURRENCES

WILDFIRE

The City of Fullerton is periodically impacted by wildfire activity due to its proximity to open space areas in the Chino Hills and the influence of Santa Ana winds. Santa Ana Canyon—the gap between the Santa Ana Mountains and the Chino Hills—is known to funnel particularly strong Santa Ana winds, which can intensify fire behavior across northern Orange County. Fullerton's location near the Santa Ana Canyon contributes to its vulnerability to regional wildfire events. Several of the most significant wildfires in Orange County history have affected Fullerton and its surrounding communities, including the Blue Ridge Fire, Freeway Complex Fire, Owl Fire, Bond Fire, Silverado Fire, and Airport Fire.

Table 4-25: Recent Regional Fires documents wildfire activity both within and in the vicinity of Fullerton over the past five years, based on NOAA's wildfire database and the CAL FIRE incident database. Southern California's fire season traditionally spans May through September. However, Fullerton and the broader Orange County region have experienced some of their most destructive wildfires during the fall and winter months. These fires have varied in scale, with acreage ranging from a few hundred to over 23,000 acres, and have occurred both within and outside the bounds of the traditional wildfire season.

TABLE 4-25: RECENT REGIONAL FIRES

NAME	LOCATION	BEGIN DATE	ACRES CLAIMED
Silverado Fire	Santa Ana Mountains and foothills	10/26/2020	12,466
Blue Ridge Fire	Yorba Linda and Chino Hills area	10/26/2020	13,964
Bond Fire	Silverado Canyon	12/2/2020	6,686
Airport Fire	Western Riverside County	12/26/2020	1,087
Chaparral Fire	Santa Ana Mountains and foothills	8/28/2021	1,427
Emerald Fire	Coastal Orange County	2/10/2022	154
Jim Fire	Santa Ana Mountains and foothills	3/2/2022	553
Coastal Fire Incident	Coastal Orange County	5/11/2022	200
Airport Fire	Trabuco Canyon and Rose Canyon	9/9/2024	23,526

Source: NOAA: National Centers for Environmental Information, Storm Events Database, https://www.ncdc.noaa.gov/stormevents/, accessed September 23, 2025.
California Department of Forestry and Fire Protection, Incident Database, https://www.fire.ca.gov/incidents/, accessed September 23, 2025.

In comparison, **Table 4-26: Major Wildfires in Orange County** identifies the most significant historical fires in the county dating back to 2006. Significant fires are defined as those burning over 10,000 acres either within or partially within Orange County. A total of 7 major wildfires since 2006 have occurred, the most recent in 2024. Acreage burned ranges from 10,592 acres to over 30,000 acres.

TABLE 4-26: MAJOR WILDFIRES IN ORANGE COUNTY

FIRE NAME	ACRES	DATE
Sierra	10,592	2006
Santiago	28,430	2007
Freeway Complex	30,305	2008
Holy	23,025	2018
Blue Ridge	13,695	2020
Silverado	12,469	2020
Airport	23,526	2024

Source: CAL FIRE, Incidents, https://www.fire.ca.gov/incidents, accessed September 23, 2025.

Freeway Complex Fire (2008) Originating near SR-91 and Green River Road, this fire merged with the Landfill Fire from Brea and consumed 30,305 acres across four counties.[70] Fullerton experienced degraded air quality. Damage across the region totaled nearly $125 million.

Canyon 2 Fire (2017) Sparked in Anaheim, this fire burned 9,217 acres.[71] Though Fullerton was not directly impacted by flames, poor air quality led to school activity cancellations and indoor relocations.

Blue Ridge Fire (2020) Started north of SR-91 in the Chino Hills and Yorba Linda area, this fire burned nearly 14,000 acres.[72] Fullerton was under threat of evacuation and experienced significant smoke and ash fallout. The fire strained emergency resources due to its timing alongside the Silverado Fire and the COVID-19 pandemic.

Silverado Fire (2020) Ignited near Santiago Canyon Road and Silverado Canyon Road, this fire burned 13,390 acres and prompted evacuation orders for 90,000 residents.[73] Two firefighters were critically injured.[74] Fullerton experienced air quality degradation and regional emergency coordination impacts.

Bond Fire (2020) Sparked by a house fire in Silverado Canyon, the Bond Fire burned 6,686 acres and destroyed 31 structures.[75] It prompted evacuations of 25,000 residents and injured two firefighters.[76] The fire occurred just weeks after the Silverado Fire and overlapped its burn scar, compounding regional recovery efforts.

Airport Fire (2024) Accidentally ignited by Orange County Public Works crews in Trabuco Canyon, this fire burned 23,526 acres across Orange and Riverside counties. It destroyed 160 structures and injured 21 people.[77] Fullerton experienced poor air quality and regional emergency coordination impacts. The fire prompted widespread evacuations and strained firefighting resources due to concurrent wildfires in neighboring counties.

---

[70] CAL FIRE, *Freeway Complex*, https://www.fire.ca.gov/incidents/2008/11/15/freeway-complex/, accessed September 23, 2025.
[71] CAL FIRE, *Canyon Fire 2*, https://www.fire.ca.gov/incidents/2017/10/9/canyon-2-fire, accessed September 23, 2025.
[72] CAL FIRE, *Blue Ridge Fire*, https://www.fire.ca.gov/incidents/2020/10/26/blue-ridge-fire, accessed September 23, 2025.
[73] CAL FIRE, *Silverado Fire*, https://www.fire.ca.gov/incidents/2020/10/26/silverado-fire, accessed September 23, 2025.
[74] Los Angeles Times, *Orange County under siege by wildfires; 2 firefighters gravely burned*, https://www.latimes.com/california/story/2020-10-26/silverado-fire-ignites-in-orange-county, accessed September 23, 2025.
[75] CAL FIRE, *Bond Fire*, https://www.fire.ca.gov/incidents/2020/12/2/bond-fire/, accessed September 23, 2025.
[76] Los Angeles Times, *Bond fire rapidly jumps through Orange County canyons, forcing evacuations*, https://www.latimes.com/california/story/2020-12-03/wind-driven-bond-fire-threatens-homes-in-orange-county-as-santa-anas-hit-southern-california, accessed September 23, 2025.
[77] CAL FIRE, *Airport Fire*, https://www.fire.ca.gov/incidents/2024/9/9/airport-fire, accessed September 23, 2025.

In the last five years, three FEMA-declared disasters for wildfire have affected the planning area:

- FM-5381-CA: Blue Ridge Fire – October 26, 2020
- FM-5380-CA: Silverado Fire – October 26, 2020
- FM-5383-CA: Bond Fire – December 3, 2020

Refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area** for a full list of federally declared disasters affecting the planning area.

URBAN FIRE

The City of Fullerton does not have a history of significant or widespread urban fire incidents. Like most urbanized communities, Fullerton has experienced isolated structure fires over the years, including residential house fires and occasional commercial building fires. These events are typically contained by the Fullerton Fire Department and do not result in large-scale impacts to the broader community.

Several notable incidents have occurred in recent years that highlight the potential risks associated with urban fire.

February 6, 2025: A residential fire in Fullerton escalated into a fully engulfed blaze due to hoarding conditions inside the home. Although no injuries occurred, the fire caused severe property damage and displaced one resident and their pet.

January 3, 2025: A small plane crashed into a furniture warehouse near Fullerton Municipal Airport, igniting a four-alarm fire that injured 19 people and killed two. The fire caused extensive damage to the building and prompted a large-scale emergency response and evacuation. This incident was highly unusual and not representative of typical urban fire activity in the city.[78]

January 22, 2024: A structure fire near Orangethorpe Elementary School prompted a temporary lockdown of the campus as a precautionary measure. The fire was contained, and no injuries were reported, but the incident underscored the potential for urban fires to disrupt public safety operations and affect sensitive facilities.[79]

November 29, 2022: A house fire near Glenhaven and Highland avenues resulted in one man sustaining serious burn injuries and three dogs requiring medical care. The fire, believed to

[78] ABC, *2 killed, 19 injured after small plane crashes through roof of Fullerton building*, https://abc7.com/post/small-plane-crashes-fullerton-resulting-4-alarm-fire-police-say/15742833/, accessed September 22, 2025.
[79] KTLA5, *Fire in Fullerton causes school lockdown*, https://ktla.com/video/fire-in-fullerton-causes-school-lockdown/9351338/, accessed September 22, 2025.

have originated in the garage, was exacerbated by cluttered conditions and required coordinated efforts from emergency responders. [80]

While these incidents demonstrate that urban fires do occur in Fullerton, they have been isolated in nature and have not resulted in widespread damage or long-term disruption. The city maintains robust fire response capabilities through the Fullerton Fire Department and mutual aid agreements with neighboring jurisdictions, which help mitigate the impacts of urban fire events when they arise.

No federally declared disasters relating to urban fire have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

4.10.4 PROBABILITY OF FUTURE OCCURRENCES

WILDFIRE

The probability of future wildfire occurrence in the City of Fullerton has been determined by the LHMP Planning Team to be highly likely. While Fullerton is largely urbanized, portions of the city are designated as moderate to very high fire hazard severity zones with elevated wildfire hazard potential. Although Fullerton has not experienced large-scale wildfires within city limits, the proximity to regional wildland areas and the potential for wind-driven fire spread during dry seasons contribute to ongoing vulnerability.

Based on historical trends and current conditions, the probability of future wildfire incidents affecting Fullerton is considered highly likely, indicating a 90 to 100 percent chance of occurrence within the next year or a recurrence interval of less than one year.

URBAN FIRE

The probability of future urban fire incidents in Fullerton has been determined by the LHMP Planning Team to highly likely. Urban fires are a more frequent and localized hazard than wildfires. Fullerton's dense development pattern, aging building stock, and mix of land uses contribute to the potential for fire outbreaks caused by electrical faults, cooking accidents, industrial processes, or arson. Areas with older infrastructure, high occupancy buildings, and industrial operations are more susceptible to fire ignition and rapid spread.

The Fullerton Fire Department actively engages in fire prevention, code enforcement, and public education to reduce the risk of urban fires. However, the presence of hazardous materials, high-density housing, and commercial corridors means that even small fires can result in significant property damage, displacement, and service disruption. Based on historical trends and current conditions, the probability of future urban fire incidents in Fullerton is considered highly likely, indicating a 90 to 100 percent chance of occurrence within the next year or a recurrence interval of less than one year.

---

[80] KTLA5, *Man in critical condition, dogs injured after Fullerton house fire*, https://ktla.com/news/local-news/man-in-critical-condition-dogs-injured-after-fullerton-house-fire/, accessed September 22, 2025.

4.10.5 CLIMATE CHANGE

WILDFIRE

Climate change and global warming patterns cause an increase in temperatures, as well as more frequent and intense drought conditions. This is understood to be a contributing factor to more frequent and severe wildfires. As mentioned previously, the severity of a wildfire is dependent on the amount of oxygen, heat, wind, relative humidity, and fuel. Most of these factors have direct or indirect ties to climate change and increased global temperatures.

A 2016 study identified the contribution of climate change to dry vegetation as it doubled the occurrence of large fires from 1984 and 2015 throughout the western United States.[81] As climate change continues to increase global temperatures, drought conditions and excessive heat may become more common.[82] Excessive heat and low humidity during the summer and fall months are likely to occur. This would increase dry vegetation, which could cause wildfires to move more quickly or spread into developed areas.

URBAN FIRE

Climate change is expected to increase the frequency and severity of urban fires due to rising temperatures, prolonged droughts, and more extreme weather events. As cities experience hotter and drier conditions, vegetation in urban and suburban areas becomes more flammable, and the risk of ignition from human activity or infrastructure failures grows. Additionally, as wildfire risk increases with climate change, so does the risk of wildfire spreading to urban and suburban areas. These risks are compounded by the urban heat island effect and expanding development into fire-prone zones, making cities more vulnerable to fire-related hazards.

4.10.6 VULNERABILITY ASSESSMENT

WILDFIRE

To identify populations at risk for wildfire hazards, hazard data layers from CAL FIRE's LRA FHSZ were overlaid and compared with City parcel data in Geographic Information Systems, ArcGIS. The CAL FIRE federal responsibility area (FRA) is not included in this assessment as it is unknown if the FRA is within an FHSZ. If the LRA FHSZ layer either completely or partially overlapped with a parcel in the data layer, then the entire parcel is conservatively considered vulnerable in this analysis. In many instances, the LRA FHSZ intersected with only small portions of individual properties. However, to provide a detailed understanding of risk and vulnerability as part of this hazard mitigation plan, these parcels (including all residential and non-residential development on the parcel, regardless of location) are considered vulnerable.

---

[81] John, T. Abatzoglou, and A. Park William, "*Impact of Anthropogenic Climate Change on Wildfire Across western US Forests,*" Proceedings of the National Academy of Sciences, October 10, 2016. https://www.pnas.org/doi/10.1073/pnas.1607171113, accessed September 11, 2025.
[82] National Oceanic and Atmospheric Administration, *Wildfire Climate Connection*, https://www.noaa.gov/noaa-wildfire/wildfire-climate-connection, accessed September 11, 2025.

Wildfire hazard zones in the City of Fullerton are primarily located around the Robert E. Ward Nature Preserve, Panorama Nature Preserve, and the Coyote Hills Golf Course. These areas contain a mix of open space, vegetation, and sloped terrain that increase the risk of wildfire ignition and spread. A detailed inventory of vulnerable assets is provided in **Table 4-27: Critical Facilities and Facilities of Concern Vulnerable to Wildfire**, which lists the critical facilities and facilities of concern located within the mapped LRA FHSZ.

TABLE 4-27: CRITICAL FACILITIES AND FACILITIES OF CONCERN VULNERABLE TO WILDFIRE

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
Critical Facilities			
8	Fire Station 6	Fire Station	$1,630,720
22	Laguna Lake Park	Park	Not Available
64	Bridge 55C0526	Bridge	Assumed $583/SF
84	Hawks Point Pump Station (1)	Pump Station	$525,000
85	Hawks Point Pump Station (2)	Pump Station	$525,000
86	Hawks Pointe Reservoir	Reservoir	$1,500,000
87	Hermitage Pump Station (1)	Pump Station	$525,000
88	Hermitage Pump Station (2)	Pump Station	$525,000
89	Hermitage Pump Station (3)	Pump Station	$525,000
90	Hermitage Pump Station (4)	Pump Station	$525,000
91	Hermitage Pump Station (5)	Pump Station	$525,000
92	Hermitage Reservoir	Reservoir	$1,500,000
99	Laguna Pump Station (2)	Pump Station	$525,000
100	Laguna Pump Station(1)	Pump Station	$525,000
101	Laguna Reservoir	Reservoir	$1,500,000
102	Las Palmas Pump Station (1)	Pump Station	$525,000
103	Las Palmas Pump Station (2)	Pump Station	$525,000
104	Las Palmas Reservoir	Reservoir	$1,500,000
118	State College Pump Station (1)	Pump Station	$525,000
119	State College Pump Station (2)	Pump Station	$525,000
120	State College Reservoir	Reservoir	$1,500,000
121	Tank Farm Pump Station (1)	Pump Station	$525,000
122	Tank Farm Pump Station (2)	Pump Station	$525,000
123	Tank Farm-T1 Reservoir	Reservoir	$1,500,000
124	Tank Farm-T2 Reservoir	Reservoir	$1,500,000
125	Tank Farm-T3 Reservoir	Reservoir	$1,500,000
126	Tank Farm-T4 Reservoir	Reservoir	$1,500,000
127	Tank Farm-T5 Reservoir	Reservoir	$1,500,000
128	Upper Acacia Pump Station (1)	Pump Station	$525,000

ID	NAME	FACILITY TYPE	REPLACEMENT VALUE
129	Upper Acacia Pump Station (2)	Pump Station	$525,000
130	Upper Acacia Pump Station (3)	Pump Station	$525,000
131	Upper Acacia Pump Station (4)	Pump Station	$525,000
132	Upper Acacia-T1 Reservoir	Reservoir	$1,500,000
133	Upper Acacia-T2 Reservoir	Reservoir	$1,500,000
Facilities of Concern			
25	Rolling Hills Elementary School	Education	$12,242,628
46	Sunrise of Fullerton	Healthcare/Assisted Living Facility	$6,536,250
47	Park Vista	Healthcare/Assisted Living Facility	$6,536,250
59	Kindred Hospital Brea - Subacute	Healthcare/Assisted Living Facility	$6,536,250
66	Park Vista at Morningside	Healthcare/Assisted Living Facility	$6,536,250

A total of 34 critical facilities are located within the wildfire hazard zone. These primarily include water system infrastructure such as pump stations and reservoirs, which are essential for firefighting operations and maintaining water supply. Also included are one fire station, a public park, and a transportation bridge—all of which play key roles in emergency response, community access, and public safety. Damage to these facilities could impair firefighting capabilities, limit access to recreational and evacuation routes, and disrupt water service delivery. Additionally, five facilities of concern are located within the wildfire hazard zone, consisting mostly of healthcare and assisted living facilities and one school. These facilities serve vulnerable populations who may require assistance during evacuation and are at increased risk from smoke exposure and fire-related disruptions. Damage or inaccessibility of these sites could hinder medical care, educational continuity, and community support services.

Approximately 7,058 residential units are located within the LRA FHSZ. The vulnerability assessment cross-referenced hazard layers with parcel data layers in GIS. The number of vulnerable residential units multiplied by the average of 2.91 persons per household for Fullerton indicates that approximately 20,537 people reside in the LRA FHSZ. Approximately 93,056,137 square feet of non-residential structures are located within the LRA FHSZ. Refer to **Table 4-28: Populations at Risk for LRA Fire Hazard Severity Zone** for a summary of vulnerable residents, residential units, and non-residential buildings.

TABLE 4-28: POPULATIONS AT RISK FOR LRA FIRE HAZARD SEVERITY ZONE

RESIDENTS AT RISK	RESIDENTIAL UNITS AT RISK	NON-RESIDENTIAL AREA AT RISK (SQ.FT.)
20,537 residents	7,057 residential units	93,056,137 sq. ft.

Depending on the extent and magnitude of a wildfire event, major transportation routes could become severely congested or inaccessible, complicating evacuation and emergency response. Limited exit routes in wildfire-prone areas may delay evacuation efforts and increase risk to residents. Wildfire smoke may trigger emergency medical events and hinder mobility, while also affecting air quality beyond City boundaries. Impacts to critical facilities such as pump stations, reservoirs, and utility infrastructure could result in loss of power, gas, and water supply. Facilities designated as shelter or staging locations may be damaged or inaccessible, increasing the vulnerability of residents to secondary hazards such as smoke inhalation and heat exposure. These disruptions could significantly impair the City's ability to coordinate emergency operations and protect public health and safety.

URBAN FIRE

Urban fires pose a significant threat to the City of Fullerton due to the dense concentration of residential, commercial, and public infrastructure throughout the community. Unlike wildfires, which are typically confined to open space or hillside areas, urban fires originate within developed environments and can rapidly spread through neighborhoods, business districts, and public facilities. Given this context, a conservative planning approach assumes that the entire City is potentially vulnerable to urban fire hazards. This includes all 167 critical facilities, 69 facilities of concern, 47,484 occupied residential units, and the full population of 141,278 residents.

Urban fires can result in severe property damage, injuries, and loss of life. Critical facilities such as municipal buildings, emergency service providers (fire and police stations), water and power utilities, and transportation infrastructure may be directly impacted or rendered inaccessible. Damage to these assets could disrupt emergency response, delay evacuations, and impair the delivery of essential services. Facilities of concern—including schools, healthcare centers, assisted living facilities, and community service providers—are particularly vulnerable due to the presence of sensitive populations and the need for rapid evacuation and continuity of care.

Residential areas face the greatest exposure, with the potential for widespread displacement, structural damage, and long-term recovery challenges. Urban fires may also escalate into larger wildfire events if they occur near open space or designated Fire Hazard Severity Zones (FHSZ), compounding the threat to surrounding communities and natural resources.

The operational impacts of an urban fire could be extensive, affecting public safety, utility systems, transportation networks, and the City's ability to coordinate emergency response and recovery. Mitigation efforts should prioritize fire prevention, rapid response capabilities, and community preparedness to reduce the risk and consequences of urban fire events across Fullerton.

4.10.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Since the 2020 LHMP, the City of Fullerton has experienced less than one percent population growth. Housing development has grown by approximately 4.2 percent, with new construction, residential infill, mixed-use redevelopment, and rehabilitation of existing structures contributing to a modest expansion of the built environment. These changes have generally occurred outside of the VHFHSZs, which are concentrated in the northwestern and northeastern portions of the city—specifically around the Robert E. Ward Nature Preserve, Panorama Nature Preserve, and Coyote Hills Golf Course. While wildfire vulnerability in these areas remains high due to proximity to natural vegetation and open space, recent development has not significantly encroached into these zones. However, urban fire is a non-mapped hazard and can affect any developed area within the city. As such, even modest citywide growth over the past five years has contributed to a slight increase in vulnerability to urban fire.

Over the next five years, Fullerton is expected to accommodate substantial residential growth to meet its RHNA allocation of 13,209 housing units by 2029. Much of this development is anticipated within the HIOZ, which includes 759 parcels concentrated along Commonwealth Avenue, South Harbor Boulevard, East Valencia Drive, and other corridors. These areas do not overlap with mapped VHFHSZs and are not expected to experience increased wildfire vulnerability. However, because urban fire can occur in any developed area, future growth will increase exposure to fire-related hazards. As the built environment expands, the potential for fire ignition, property damage, and strain on emergency response systems may grow. This underscores the importance of fire-safe building practices, code enforcement, and emergency preparedness across all areas of the city.

In summary, wildfire vulnerability in Fullerton has remained relatively stable over the past five years due to limited development in mapped VHFHSZs. Urban fire vulnerability, however, has increased slightly due to citywide development and population growth. Looking ahead, future development under the HIOZ program is not expected to encroach into wildfire-prone areas but will contribute to a moderate rise in urban fire vulnerability. As Fullerton continues to grow, it is essential to maintain fire prevention strategies and ensure that new development incorporates fire-resilient design and infrastructure to reduce risk across the city.

4.10.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area, including census tracts with concentrations of individuals with AFN or limited adaptive capacity. Wildfire and urban fire hazards pose distinct but overlapping risks to the City of Fullerton. Mapped wildfire hazards are concentrated in Very High Fire Hazard Severity Zones (VHFHSZ), primarily located in two key areas: the Robert E. Ward Nature Preserve at the northwestern boundary of the city, which includes adjacent residential neighborhoods surrounded by high and moderate fire hazard severity zones; and the northeast portion of Fullerton including the Panorama Nature Preserve and the Coyote Hills Golf Course, along with nearby residential land uses. Mapped wildfire zones do not overlap with census tracts identified as having high concentrations of vulnerable populations; however, it is important to note that AFN populations may reside

throughout the city, including areas adjacent to wildfire-prone zones. In contrast, urban fire hazards are not geographically confined and have the potential to impact any or all areas of the City, including all designated vulnerable census tracts—specifically Census Tracts 001404, 001801, 001802, 086701, 011000, 001902, 011601, 011602, 011403, 011502, 011504, and 011711.

Vulnerable groups—including older adults, individuals with disabilities, linguistically isolated households, and residents in multi-unit, crowded households or group housing—face heightened risks from fire hazards due to mobility limitations, communication barriers, and socioeconomic constraints. Older adults and individuals with disabilities may have difficulty evacuating quickly during fast-moving fires, especially if dependent on caregivers or medical equipment. Linguistically isolated households may not receive or understand emergency alerts or evacuation instructions, increasing their risk during fire emergencies. Residents in multi-unit housing or group quarters may face challenges related to building design, limited escape routes, and overcrowding, which can complicate evacuation and increase exposure to smoke and fire-related injuries.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation Actions #1, 3, 11, 17, 18, 21 and 22 with these groups in mind, including efforts to improve fire safety education, enhance emergency alert systems in multiple languages, and support evacuation planning and shelter access for AFN populations in both wildfire-prone and urbanized areas of the City.

4.11 HUMAN-CAUSED HAZARDS (AIRCRAFT/TRANSPORTATION/TRAIN INCIDENTS, HAZARDOUS MATERIALS RELEASE/SPILL, TERRORISM/CYBERSECURITY/ACTIVE SHOOTER, CIVIL UNREST, VECTOR-BORNE DISEASE, PANDEMIC)

4.11.1 DESCRIPTION

AIRCRAFT/TRANSPORTATION/TRAIN INCIDENTS

Aircraft, transportation, and train incidents refer to unexpected events involving the failure, collision, derailment, or crash of vehicles used for public or commercial transit. These incidents can occur on land, in the air, or along rail corridors, and may result in significant impacts to public safety, infrastructure, and the environment.

Aircraft incidents, particularly those involving loss of control, are among the leading causes of aviation fatalities worldwide.[83] Train derailments and rail-related accidents can be triggered by mechanical failure, operator error, track defects, or external factors such as weather or

[83] Federal Transit Administration, *Safety Risk Mitigations and Corrective Actions*, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/regulations-and-guidance/safety/public-transportation-agency-safety-program/134101/safety-risk-mitigations-and-corrective-actions-guide.pdf, accessed September 10, 2025.

debris.[84] When hazardous materials are involved, these events can escalate into large-scale emergencies requiring specialized response.

Such incidents are considered high-consequence hazards due to their potential to cause a wide range of serious impacts. These include injuries or fatalities among passengers, operators, and nearby individuals; disruption of critical transportation routes, which can hinder emergency response and daily mobility; and environmental contamination, particularly when hazardous materials are involved. Additionally, aircraft, transportation, and train incidents can result in extensive property damage to public infrastructure and private assets, as well as significant economic losses stemming from service interruptions, cleanup efforts, health impacts, and legal liabilities.

HAZARDOUS MATERIALS RELEASE/SPILL

A hazardous material is a substance that, because of its quantity, concentration or physical or chemical composition, poses a significant present or potential hazard to human health and safety or to the environment if released. The term "release" means spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.[85] Hazardous materials can be in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. Hazardous materials accidents can occur during production, storage, transportation, use, or disposal.[86]

Additionally, oil and gas operations pose environmental and public health risks through air pollution, groundwater contamination, and odor nuisances that affect nearby communities. Toxic emissions—including volatile organic compounds and other hazardous pollutants—can lead to respiratory, neurological, and dermatological symptoms, with studies linking proximity to oil wells to increased rates of asthma, headaches, and skin irritation. Poorly constructed or inadequately maintained facilities heighten the risk of leaks, aquifer contamination, and explosions. Even abandoned wells can release harmful substances if not properly cleaned, and the process of plugging or decommissioning wells may trigger short-term health effects such as nausea, vomiting, rashes, and worsened respiratory conditions.

The impacts of a hazardous materials release can vary, depending on the type and amount of material released. Hazardous materials exposure can include the following effects: skin/eye irritation; difficulty breathing; headaches; nausea; behavior abnormalities; cancer; genetic

---

[84] Federal Transit Administration, Recommended Emergency Preparedness Guidelines for Rail Transit Systems, https://www.transit.dot.gov/regulations-and-guidance/safety/recommended-emergency-preparedness-guidelines-rail-transit-systems, accessed September 10, 2025.
[85] Health and Safety Code Division 20, Chapter 6.95, *Hazardous Materials Release Response Plans and Inventory*, Article 1.
[86] Department of Homeland Security, *Hazardous Materials Incidents*, https://www.ready.gov/hazardous-materials-incidents, accessed September 10, 2025.

mutations; physiological malfunctions (i.e., reproductive impairment, kidney failure); physical deformations; or birth defects.[87]

TERRORISM/CYBERSECURITY/ACTIVE SHOOTER

Terrorism, cybersecurity threats, and active shooter incidents represent complex and evolving hazards that pose serious risks to public safety, infrastructure, and community resilience. Domestic terrorism is defined by the Federal Bureau of Investigation (FBI) as perpetuated by individuals and/or groups inspired by or associated with a primarily United States based movement that espouses extremist ideologies of a political, religious, social, racial, or environmental nature. International terrorism is perpetuated by individuals and/or groups inspired by or associated with designated foreign terrorist organizations or nations (i.e., State sponsored).[88] The United States Federal Code states that terrorism must be intended to 1) intimidate or coerce a civilian population; 2) influence the policy of a government by intimidation or coercion; or, 3) affect the conduct of a government by mass destruction, assassination, or kidnapping.[89]

Cybersecurity threats, including cyberterrorism and cyber-attacks, are increasingly prevalent as critical infrastructure and public services rely on digital systems. According to the National Institute of Standards and Technology (NIST), cyber-attacks aim to disrupt, disable, or maliciously control computing environments, or compromise the integrity of data.[90] These attacks may originate from external hackers seeking financial gain or internal actors with personal motives. Common methods include malware, phishing, and ransomware—each capable of causing widespread disruption to essential services and data systems.

Active shooter incidents are defined by the FBI as events where an individual is actively engaged in killing or attempting to kill people in a populated area. These incidents are often unpredictable, evolve rapidly, and may result in mass casualties.[91] Active shooters frequently target public spaces such as schools, places of worship, and transportation hubs. While there is no single profile of an active shooter, such events often stem from unresolved grievances and a perceived need for violent resolution.

Together, these hazards can overwhelm emergency response systems, disrupt essential services, and cause significant psychological, physical, and economic harm.

---

[87] U.S. EPA, *Health and Ecological Hazards Caused by Hazardous Substances*, https://www.epa.gov/emergency-response/health-and-ecological-hazards-caused-hazardous-substances, accessed September 10, 2025.
[88] Federal Bureau of Investigation, *Terrorism*, https://www.fbi.gov/investigate/terrorism, accessed September 10, 2025.
[89] U.S. Federal Code Title 18, Chapter 113B, Section 2331.
[90] National Institute of Standards and Technology, NIST Special Publication 1800-10, *Protecting Information and System Integrity in Industrial Control System Environments: Cybersecurity for the Manufacturing Sector*, https://csrc.nist.gov/pubs/sp/1800/10/final, accessed September 10, 2025.
[91] Federal Bureau of Investigation, *OPS Active Shooter Guide*, https://www.fbi.gov/file-repository/active-shooter-508.pdf/view, accessed September 10, 2025.

CIVIL UNREST

FEMA defines civil unrest as an activity such as a demonstration, riot, or strike that disrupts a community and requires intervention to maintain public safety. Civil unrest can also be referenced as civil disorder, civil disturbance, or social unrest. The Orange County Emergency Operations Plan (EOP) notes that civil disturbance often arises from a mass act of civil disobedience that escalates when participants become hostile towards authority. According to the County of Orange, civil disturbances may be triggered by:[92]

- Spontaneous reactions to verdicts in high-profile trials (retaliation or celebration)
- Spontaneous reactions to organized sporting event outcomes
- Organized reactions or demonstrations
- Political rallies or demonstrations

A civil disturbance could be initiated by small gatherings or large crowds. Impacts can range from a passive disturbance where groups block roadways or buildings that interfere with public order, or full-scale riots where participants also commit crimes such as arson, theft, property damage, vandalism, assault, or other violence. Secondary impacts from civil disturbance can vary significantly, and potentially include urban fire, utility failure, transportation, and environmental hazards. While rare, the most significant impact is the interruption of the continuity of government.

In Orange County, responses to civil unrest are generally handled at the City level; in the case of Fullerton, the local Fullerton Police Department would serve as the primary response agency. If restoration of law and order is beyond local and county abilities, state and federal resources could be deployed.

VECTOR-BORNE DISEASE

Infectious diseases are caused by undesirable organisms (insects, bacteria, viruses, etc.), resulting in health impacts, symptoms and/or serious harm to plants, animals, or humans. These organisms threaten human health by infecting people with disease, some of which are potentially fatal. Vector-borne diseases are a type of infectious disease which the World Health Organization (WHO) defines as human illnesses caused by parasites, viruses, and bacteria that are only transmitted by vectors. In this context, vectors are "living organisms that can transmit infectious pathogens between humans, or from animals to humans".[93]

Communicable disease is an umbrella term for infectious diseases that are spread from one person to another through contaminated surfaces, bodily fluids, and through the air. In any case, infectious diseases transmitted from vector-to-person or person-to-person may have significant health impacts and symptoms that affect the structure or function of the immune,

---

[92] County of Orange, *Unified County of Orange and Orange County Operational Area Emergency Operations Plan*, February 2019.
[93] World Health Organization, *Vector-Borne Diseases*, https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases, accessed September 10, 2025.

neurological, or other physiological system of the human body. In many cases, infectious diseases have severe health impacts up to and including death.

Specific vectors of concern in Fullerton include mosquitos, ticks, rodents, and other animals. These vectors are known carriers of hantavirus, rabies, West Nile Virus (WNV), and tick-borne diseases such as Lyme disease.

PANDEMIC

The Centers for Disease Control and Prevention (CDC) defines an epidemic as an increase, often sudden, in the number of cases of a disease above what is normally expected in a population. The CDC makes the distinction that a pandemic refers to an epidemic that has spread over several countries or continents, usually affecting signification proportions of the population.[94] This definition of pandemic refers specifically to infectious diseases that have spread over or impacted large geographic areas. Non-infectious diseases, such as asthma or diabetes, may exist in "pandemic proportions" but do not readily spread throughout a population and thus do not constitute a pandemic. Pandemics also exclude vector-borne diseases, categorized by transmission through a vector (rats, mosquitos, etc.).

Pandemics require two components: 1) an agent (disease or virus) and 2) a susceptible host population. The host population, usually humans, is the primary mode by which agents are spread under this definition of pandemic. Pandemic agents are spread from person to person through direct or indirect contact, so humans are understood to be the causal element of pandemics. Airborne diseases and those spread through physical contact pose higher risks to the community because they are difficult to isolate and control. Diseases such as influenza, pertussis, tuberculosis, and meningitis are spread by these pathways and therefore have the potential to reach pandemic levels.

Viruses of special concern in pandemics are novel viruses, which are new viral strains not previously identified in humans. Novel viruses present public health challenges as limited information about transmission, prevention, and treatment is available. Further, the human body does not have natural immune defenses prepared to fight novel viruses.[95] In recent history, novel viruses originated as zoonotic diseases; the virus beginning in animals evolves to transfer from human to human. Examples of zoonotic diseases becoming human pandemics include Covid-19 (theorized to originate in bats), H1N1 influenza (originated in pigs), and H5N1 influenza (originated in birds).[96]

---

[94] CDC, *Lesson 1: Introduction to Epidemiology*, Section 11, https://archive.cdc.gov/#/details?url=https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html, accessed September 10, 2025.
[95] GoodRX Health, *The Novel Coronavirus: What are Novel Viruses, and How do they Impact Public Health?*, https://www.goodrx.com/conditions/covid-19/what-does-novel-coronavirus-mean-science-medical-definition, updated February 21, 2023, accessed September 10, 2025.
[96] CDC, *Lesson 1: Introduction to Epidemiology*, Section 11, https://archive.cdc.gov/#/details?url=https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html, accessed September 10, 2025.

4.11.2 LOCATION/EXTENT

AIRCRAFT/TRANSPORTATION/TRAIN INCIDENTS

Transportation-related hazards are of particular concern in urban areas like Fullerton, where multiple transit modes intersect and where dense populations increase the potential for cascading impacts. The City of Fullerton is a major transportation hub in northern Orange County, intersected by a complex network of highways, rail lines, and air traffic routes. This multimodal infrastructure supports regional mobility but also introduces potential hazards associated with transportation-related incidents. Transportation-related incidents have the potential to impact any area within the City of Fullerton, though they are more likely to occur in proximity to major infrastructure such as highways, rail corridors, transit stations, and the municipal airport where transit activity is most concentrated.

Fullerton's arterial roadway system includes key east-west corridors such as Imperial Highway (State Route 90), Bastanchury Road, Malvern/Chapman Avenue, Commonwealth Avenue, and Orangethorpe Avenue. North-south routes include Beach Boulevard (State Route 39), Euclid Street, Harbor/Brea Boulevard, State College Boulevard, and Placentia Avenue. These roads connect to major freeways including the Orange Freeway (SR-57) along the eastern border, the Riverside Freeway (SR-91) along the southern edge, and the Santa Ana Freeway (I-5) near the southwestern city limits. In the event of a transportation incident—such as a major collision, hazardous material spill, or freeway closure—these routes could become severely congested, complicating evacuation and emergency response efforts across the city.

Fullerton's rail infrastructure is centered around the Fullerton Transportation Center, located at 120 East Santa Fe Avenue in the heart of downtown. This station is a critical node served by Metrolink's 91/Perris Valley Line and Orange County Line, Amtrak's Pacific Surfliner and Southwest Chief routes, and freight services operated by BNSF and Union Pacific Railroads. The convergence of passenger and freight rail lines increases the risk of derailments, collisions, and hazardous material incidents, particularly in densely populated areas near the station and along the rail corridors. These lines traverse the city from east to west and north to south, passing through residential, commercial, and industrial zones. Any disruption or accident along these corridors could result in widespread impacts, including blocked crossings, structural damage, and delays in emergency access.

The Fullerton Municipal Airport, located in the southwestern portion of the city near Commonwealth Avenue and the I-5 corridor, serves general aviation aircraft and is the only airport within city limits. While it does not support commercial flights, its proximity to residential and industrial areas raises concerns about potential aircraft accidents, especially during takeoff and landing. Additionally, Fullerton lies within the broader airspace used by nearby commercial airports—John Wayne International Airport and Long Beach Airport—making it susceptible to overflight risks. Aircraft incidents, though less frequent, could have severe consequences including fire hazards, structural damage, and mass casualty events, particularly in areas adjacent to flight paths.

Transportation infrastructure spans the entire city. Thus, incidents involving aircraft, trains, or roadways have the potential to affect any area in Fullerton. The dense population and mixed

land uses—residential, commercial, and industrial—amplify the risk of cascading impacts. A major transportation incident could disrupt evacuation routes, delay emergency services, and impair communication systems. Coordination among city departments, regional transit agencies, and emergency responders would be critical to managing such events.

HAZARDOUS MATERIALS RELEASE/SPILL

Hazardous materials are generated, used, stored, and transported throughout the City of Fullerton for a wide range of purposes across residential, commercial, and industrial land uses. These materials may be present in everyday operations such as household cleaning, automotive maintenance, and small business activities, as well as in more intensive industrial processes. Because hazardous materials are not confined to a single location or land use type, potential incidents could occur anywhere in the City.

Small-scale hazardous materials incidents may arise from common sources such as gas stations, dry cleaners, medical offices, schools, and retail businesses. These typically involve substances like diesel fuel, chlorine, paint thinners, pesticides, and solvents. However, Fullerton also contains several concentrated industrial zones where larger quantities of hazardous materials may be stored or used. These zones are primarily located in the southeast portion of the city—south of the Metrolink 91-Perris Valley Line and east of the Metrolink Orange County Line; in the west, between Malvern Avenue and Commonwealth Avenue; and in the north, north of Imperial Highway. These areas are more likely to experience substantial hazardous materials incidents due to the nature and scale of industrial operations.

Additionally, oil and gas operations in Fullerton are primarily concentrated in the northern section of the city, where most oil fields are now plugged or abandoned. However, active oil wells operated by Breitburn Operating LP remain in the East Coyote Hills area. These operations can negatively affect air quality within approximately 600 feet and produce odors detectable up to 1,500 feet, raising concerns for nearby sensitive land uses such as homes, schools, and hospitals. Additionally, a Southern California Gas Company pipeline runs east-west through the center of Fullerton, posing combustion and asphyxiation risks if damaged. Pipeline failure risks are heightened by factors such as aging infrastructure, seismic activity, and population density, which can amplify the impact of potential explosions or leaks.

In addition to fixed facilities, hazardous materials are routinely transported through Fullerton via major roadways and rail corridors. The BNSF Railway, which runs through the city, is a known carrier of hazardous freight, including flammable liquids, corrosives, and other regulated substances. This creates potential risks along the rail lines, especially near densely populated or industrialized areas. Major transportation routes such as Orangethorpe Avenue, Commonwealth Avenue, and the adjacent freeways also serve as corridors for hazardous materials movement, further expanding the geographic scope of potential incidents.

While most hazardous materials activities in Fullerton are regulated and occur without incident, the combination of widespread use, industrial concentration, and active transportation routes means that both minor and major hazardous materials events remain a possibility. The severity and extent of such incidents would depend on the type of material

involved, the location of the release, and the proximity to sensitive populations or environmental resources.

Hazardous materials cleanup efforts in the City of Fullerton are monitored and documented through two statewide geodatabases: EnviroStor and GeoTracker. These systems are maintained by California's environmental regulatory agencies and serve as essential tools for tracking contamination, remediation, and regulatory oversight.

EnviroStor, managed by the California Department of Toxic Substances Control (DTSC), is a comprehensive data management system that tracks cleanup, permitting, enforcement, and investigation activities at hazardous waste facilities and sites with known or suspected contamination. It includes a wide range of site types such as Federal Superfund Sites, State Response Sites, Voluntary Cleanup Sites, Evaluation Sites, and Corrective Action Sites. EnviroStor provides detailed information about the nature of contamination, responsible parties, and the status of cleanup efforts. EnviroStor identifies multiple cleanup efforts within Fullerton, including Federal Superfund sites and other state-regulated locations undergoing voluntary or corrective action. These sites vary in size and complexity, and their distribution reflects the city's diverse land uses and industrial history.

GeoTracker, operated by the California State Water Resources Control Board, focuses on sites that impact—or have the potential to impact—water quality, with an emphasis on groundwater contamination. GeoTracker tracks Leaking Underground Storage Tank (LUST) Cleanup Sites and Cleanup Program Sites, which include a broad spectrum of facilities such as dry cleaners, industrial plants, rail yards, and bulk transfer stations. These sites may involve contaminants like petroleum hydrocarbons, solvents, heavy metals, and pesticides. While many sites have been closed following successful remediation, a significant number remain open or under active investigation. **Table 4-29: Active Cleanup Sites** identifies the ongoing cleanup efforts within the City of Fullerton.

TABLE 4-29: ACTIVE CLEANUP SITES

NAME/ID	ADDRESS	TYPE/STATUS	STATUS DATE
UNOCAL #5198 T0605900967	100 West Bastanchury Rd	LUST Cleanup Site Open - Remediation	3/13/2008
McColl Dump Site SLT8R1574166	Rosecrans Avenue W	Cleanup Program Site Open - Assessment Interim Remedial Action	6/23/2009
Aviation Facilities T10000022581	4119 Commonwealth	LUST Cleanup Site Open - Site Assessment	5/29/2024
Chinet Co. Slt8r1214092	2300 Raymer Avenue	Cleanup Program Site Open - Remediation	4/1/2013
Former Raytheon Facility T0605900143	2357 Moore Avenue	Cleanup Program Site Open - Remediation	2/15/2006
Raytheon Corporation T10000007668	1901 W. Malvern Ave	Cleanup Program Site Open - Remediation	9/18/2015

NAME/ID	ADDRESS	TYPE/STATUS	STATUS DATE
Fullerton Manufacturing Company Sl208403895	311 South Highland Ave	Cleanup Program Site Open - Site Assessment	10/1/2018
De Anda Property T0605900397	300 W Valencia Dr	LUST Cleanup Site Open - Site Assessment	11/29/2023
Pennzoil/Quaker State Facility T10000008692	336 E Santa Fe Avenue	Cleanup Program Site Open - Site Assessment	3/23/2016
Orange County North Basin T10000010669	Orangethorpe Avenue	Cleanup Program Site Open - Site Assessment	7/25/2017
Rodriguez Sweeping Service T10000021239	800 E. Walnut Avenue	LUST Cleanup Site Open - Site Assessment	7/14/2023
Rodriguez Sweeping Service T10000017160	800 E. Walnut Avenue	Cleanup Program Site Open - Site Assessment	11/1/2021
Chicago Musical Instruments T10000006450	350 South Raymond	Cleanup Program Site Open - Remediation	2/2/2015
Former Arnold Engineering Slt8r2213999	1551 East Orangethorpe Avenue	Cleanup Program Site Open - Site Assessment	6/30/2017
PCA Metals Slt8r2203998	1723 East Kimberly	Cleanup Program Site Open - Site Assessment	6/1/2010
Khyber Foods Slt8r2244002	1818 East Rosslynn Avenue	Cleanup Program Site Open - Site Assessment	1/15/2025
Orange County Metal Processing Slt8r2193997	1711 East Kimberly Avenue	Cleanup Program Site Open - Site Assessment	11/7/1992
Vista Paint T10000011480	2020 East Orangethorpe Ave	Cleanup Program Site Open - Site Assessment	7/19/2019
Trent Tube Division Slt8r2224000	2100 East Orangethorpe Avenue	Cleanup Program Site Open - Site Assessment	7/19/2019
Howmet Global Fastening Systems Sl0605956921	800 South State College Boulevard	Cleanup Program Site Open - Remediation	1/29/2007
Aerojet General Groundwater Sl0605973469	601 South Placentia Avenue	Cleanup Program Site Open - Assessment & Interim Remedial Action	1/18/2011

Source: State Water Resources Control Board, GeoTracker, https://geotracker.waterboards.ca.gov/, accessed September 17, 2025.

According to the GeoTracker database, there are currently four active LUST Cleanup Sites and 17 active Cleanup Program Sites within the City of Fullerton. These sites are primarily

concentrated in the southern portions of the city, where industrial and commercial land uses are most prevalent.

Additionally, the Environmental Protection Agency (EPA) biennially collects information regarding the generation, management, and disposal of hazardous materials under the Resource Conservation and Recovery Act (RCRA). The Biennial Report Summary for 2023 indicated 15 hazardous waste generators in the City of Fullerton:

- Aerofit LLC (S. Acacia Avenue, Fullerton, CA 92831)
- AmtreND (S. Manhattan Ave, Fullerton, CA 92831)
- California State University, Fullerton (N. State College Blvd., Fullerton, CA 92634-0000)
- CVS Pharmacy #7079 (North Harbor Boulevard, Fullerton, CA 92835-0000)
- CVS Pharmacy #9598 (North State College Boulevard, Fullerton, CA 92831)
- Fullerton Custom Works Inc (E Elm Ave, Fullerton, CA 92831)
- Howmet Global Fastening Systems Inc (S State College Blvd, Fullerton, CA 92831-5334)
- Howmet Global Fastening Systems Inc (S Placentia Ave, Fullerton, CA 92831-0000)
- Inmar Supply Chain Solutions, LLC (S Sally Pl, Fullerton, CA 92831-0000)
- Kryler Corp. (E. Ash Ave., Fullerton, CA 92831)
- St Jude Medical Center (E Valencia Mesa Dr, Fullerton, CA 92835)
- Universal Molding Company (E Orangethorpe Ave, Fullerton, CA 92831)
- Walgreens #6215 (1826 W Orangethorpe Ave, Fullerton, CA 92833)
- Winonics Inc DBA Bench 2 Bench (South State College Blvd, Fullerton, CA 92831)

These sites are primarily identified as large quantity generators (LQG) which generate more than 1,000 kg of hazardous waste or more than 1 kg of acutely hazardous waste per month. Additionally, there is one generator identified as a small quantity generator (SQG) which generate between 100 to 1,000 kg of hazardous waste per month, and one generator identified as a conditionally exempt small quantity generator (CESQG) which generates less than 100 kg of hazardous waste or less than 1 kg of acutely hazardous waste per month.[97]

Hazardous materials incidents pose a significant risk to the City of Fullerton due to the widespread presence, use, and movement of regulated substances across various land uses. While industrial zones in the southern, western, and northern portions of the city contain concentrated facilities that generate, store, or transport hazardous materials—as documented in the EPA Biennial Report and tracked through databases like GeoTracker and EnviroStor—the potential for incidents is not limited to these areas. Hazardous materials are also present in commercial corridors, small businesses, schools, and households throughout Fullerton. Moreover, the city's extensive transportation infrastructure, including major arterial roadways and active rail lines such as the BNSF Railway, facilitates the movement of hazardous substances through densely populated areas. This means that even small-scale spills or leaks

[97] US EPA, *Biennial Report Search*, https://enviro.epa.gov/envirofacts/br/search, accessed September 17, 2025.

could occur anywhere in the city, while larger incidents in industrial zones or along transportation corridors could have far-reaching impacts. Whether through accidental release, equipment failure, or transportation mishaps, hazardous materials incidents in Fullerton have the potential to affect public health, environmental quality, and emergency response capabilities citywide.

TERRORISM/CYBERSECURITY/ACTIVE SHOOTER

The specific location and severity of terrorism, cybersecurity breaches, or active shooter incidents in Fullerton are inherently difficult to predict. These threats can occur anywhere within the city, but certain locations are more susceptible due to their public visibility, population density, or strategic importance. Generally, sites most vulnerable to such incidents include places where people gather, critical infrastructure, and high-profile destinations. In Fullerton, these include:

- Schools and educational institutions such as California State University, Fullerton and Fullerton College
- Hospitals and medical facilities including Providence St. Jude Medical Center
- City Hall and other government buildings
- Community centers and public libraries
- The Fullerton Transportation Center and associated Metrolink and Amtrak services
- Shopping centers such as Fullerton Town Center and Amerige Heights Town Center
- Major highways and arterial roads including SR-57, SR-91, and SR-90
- Utility infrastructure and energy distribution facilities
- Entertainment venues and event spaces

These locations represent potential targets due to their symbolic value, public accessibility, or operational significance. The severity of an incident would depend on the nature of the attack and the specific target. Additionally, Fullerton could experience secondary effects from incidents occurring in neighboring jurisdictions, particularly given its proximity to major regional infrastructure and densely populated urban centers.

Unlike physical attacks, cyberterrorism is not confined by geography. Cyberattacks can originate from anywhere and still have profound impacts on Fullerton's institutions and residents. Targets may include government systems, healthcare networks, financial institutions, educational platforms, and public utilities. A cyberattack on an energy provider, for example, could result in widespread power outages across the city, disrupting emergency services, communications, and daily life. Alternatively, smaller-scale attacks may focus on stealing personal or financial data from individuals or businesses. The effects of cyberterrorism can include service disruptions, economic losses, psychological stress, and compromised public trust.

Active shooter incidents, while rare, pose a serious threat in urban environments like Fullerton. Locations with high foot traffic or limited security—such as schools, shopping centers, transit hubs, and entertainment venues—are particularly vulnerable. The Fullerton Police Department employs intelligence-led policing and community partnerships to monitor and mitigate such risks. Nonetheless, preparedness through training, public awareness, and

coordinated emergency response remains essential to minimizing harm should such an incident occur.

CIVIL UNREST

Civil unrest can occur anywhere within the City of Fullerton. While unpredictable in nature, certain areas are more susceptible due to their visibility, accessibility, and symbolic or operational significance. Government facilities, educational institutions, and commercial corridors are common focal points for demonstrations, protests, and public gatherings. In Fullerton, locations such as City Hall, the Fullerton Police Department, Fullerton Public Library, and community centers are potential sites for politically motivated unrest. The downtown district has historically served as a gathering point for protests and marches. Additionally, California State University, Fullerton and Fullerton College are prominent institutions that may attract activism and civil demonstrations due to their large student populations and civic engagement.

Other vulnerable areas include shopping centers like Fullerton Town Center, Amerige Heights Town Center, and major intersections which may be used as protest locations. Parks, schools, and places of worship located throughout the city also represent potential gathering sites. Civil disturbances may originate in one location and migrate across neighborhoods, impacting public facilities, businesses, and private property.

The extent and severity of damage from civil unrest depends on several factors: the motivation behind the disturbance, the number of participants, and the response from law enforcement and emergency services. Minor incidents may be localized and result in limited property damage, while more severe unrest could span multiple districts, involve mass gatherings, and lead to injuries, arrests, or significant economic losses. Property damage may include vandalism, looting, and arson, with uninsured residents and business owners facing greater financial hardship. Recovery efforts may require extended downtime for cleanup, repairs, and restoration of public trust. As with other urban centers, Fullerton's vulnerability to civil unrest is shaped by its infrastructure, population density, and civic landscape.

VECTOR-BORNE DISEASE AND PANDEMIC

Vector-borne diseases and pandemics pose a significant public health threat to the City of Fullerton and, unlike many other hazards, are not confined to specific geographic locations. These types of health emergencies can impact any and all areas of the city, spreading rapidly across neighborhoods, business districts, schools, and public facilities. While the origin of an outbreak may be localized—such as a cluster of mosquito-borne illness near standing water or a respiratory virus introduced through travel—its effects can quickly extend citywide due to Fullerton's interconnected infrastructure and active population.

Outdoor spaces, particularly parks, greenbelts, and areas with poor drainage, may be more susceptible to vector activity. Mosquitoes thrive in standing water and warmer climates, while rodents and ticks may be found in unmaintained structures, alleyways, and wildland-adjacent areas. However, vectors can interact with humans anywhere in the city, including residential zones, commercial centers, and industrial sites. The severity of a vector-borne disease outbreak depends on the density of the vector population, environmental conditions, and the

vulnerability of residents—especially the elderly, immunocompromised individuals, and those living in overcrowded or underserved communities.

Pandemics, by contrast, are inherently widespread and can affect the entire city regardless of geography. Fullerton's dense urban core, public transit systems, educational institutions like California State University, Fullerton, and high-traffic commercial areas increase the risk of rapid disease transmission. Indoor environments where people gather—such as schools, offices, restaurants, and transit hubs—are particularly vulnerable to airborne or contact-based diseases. While less populated areas may experience slower spread, no part of the city is immune to pandemic impacts.

The extent and severity of a disease outbreak—whether vector-borne or pandemic—depends on the nature of the illness, its transmissibility, and the effectiveness of public health response. Some diseases may cause mild symptoms and limited disruption, while others could result in widespread illness, fatalities, and long-term economic and social consequences. In a worst-case scenario, a highly contagious and deadly disease could overwhelm healthcare systems, disrupt essential services, and require extensive coordination between city departments, regional agencies, and public health officials. Fullerton's preparedness, including vaccination programs, public education, and emergency planning, will be critical in mitigating the impacts of future outbreaks.

4.11.3 PREVIOUS OCCURRENCES

AIRCRAFT/TRANSPORTATION/TRAIN INCIDENTS

Fullerton has experienced multiple aircraft-related incidents in recent years, underscoring the need for continued vigilance. In 1986, a tragic mid-air collision occurred above the nearby city of Cerritos when a passenger jetliner struck a small propeller plane, resulting in the jetliner crashing into a residential neighborhood, killing 15 residents and destroying 16 homes. Within Fullerton itself, two notable accidents occurred at the Fullerton Municipal Airport: in 2004, a pilot was injured after losing control during an airshow and crashing shortly after takeoff, and in 2016, a small propeller plane crashed into a hangar wall, causing minor injuries to both the pilot and co-pilot. In February 2019, a twin-engine Beechcraft B60 Duke crashed shortly after takeoff from Fullerton Municipal Airport, resulting in five fatalities and extensive damage to a nearby neighborhood. The incident impacted the neighboring City of Yorba Linda raining debris and igniting a house fire before landing in a backyard.[98]

More recently, in January 2025, a small plane crashed into a furniture warehouse near the airport, killing two people and injuring 19 others, including warehouse employees and first

[98] CBS News, *Plane crash kills 5, sparks house fire, scatters debris in neighborhood outside L.A.*, https://www.cbsnews.com/news/yorba-linda-plane-crash-today-2019-02-03-live-updates/, accessed September 17, 2025.

responders.[99] These events illustrate that while aircraft incidents are infrequent, they can have devastating consequences and affect areas beyond the immediate airport vicinity.

Additionally, Fullerton has experienced several transportation-related incidents involving rail and roadway systems. In November 1999, a Metrolink train collided with a freight train near Brookhurst Road, injuring 19 people and temporarily closing the Orange County rail corridor, affecting over 3,500 commuters. More recently, in 2018, three separate rail-related incidents occurred near the Fullerton Train Depot: an Amtrak train struck a trespasser who survived with injuries, a Metrolink train fatally struck a man in an apparent suicide, and a freight train killed another individual who had entered the right-of-way. Additionally, in April 2018, a freight truck overturned on SR-57 near Bastanchury Road, shutting down the highway for nearly 12 hours.

No federally declared disasters relating to aircraft, transportation, or train incidents have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

HAZARDOUS MATERIALS RELEASE/SPILL

Fullerton has experienced several hazardous materials release incidents over the past two decades, involving substances such as diesel fuel, corrosive liquids, sewage, and ammonia. Notable events include a 2006 diesel spill into a flood control channel following a truck collision, a corrosive liquid release in 2010 caused by a forklift breach, and two significant sewage leaks in 2010 and 2015 that contaminated local storm drains and creek channels. In 2011, an ammonia release occurred due to a faulty valve, and in 2018, another diesel spill impacted SR-57 after a freight truck struck the center divider. These incidents highlight the city's vulnerability to transportation and infrastructure-related hazardous material releases.

Additional hazardous materials releases in the City of Fullerton have been documented through state and federal reporting systems, including the California Department of Toxic Substances Control's EnviroStor database and the State Water Resources Control Board's GeoTracker system. These databases track both historical and active cleanup efforts related to hazardous substances, including petroleum hydrocarbons, solvents, heavy metals, and other regulated chemicals. According to GeoTracker, Fullerton currently has four active Leaking Underground Storage Tank (LUST) Cleanup Sites and 17 active Cleanup Program Sites, primarily concentrated in the southern portions of the city where industrial and commercial land uses are most prevalent. These sites reflect a history of spills and contamination events that have required formal investigation and remediation.

EnviroStor identifies multiple cleanup efforts within Fullerton, including Federal Superfund Sites, State Response Sites, Voluntary Cleanup Sites, and Corrective Action Sites. These locations vary in size and complexity, and their distribution reflects the city's industrial legacy and diverse land uses. Many of these sites are associated with facilities that generate

[99] ABC News, *2 dead, 19 hurt after small plane crashes into furniture warehouse in Southern California*, https://abcnews.go.com/US/18-hurt-after-small-plane-crashes-building-southern/story?id=117284216, accessed September 17, 2025.

hazardous waste as part of routine operations. According to the U.S. Environmental Protection Agency's Biennial Report Summary for 2023, Fullerton is home to 15 hazardous waste generators, most of which are classified as Large Quantity Generators (LQGs). These facilities include manufacturers, supply chain operations, medical centers, and retail pharmacies, and are located throughout the city, with notable concentrations along State College Boulevard, Orangethorpe Avenue, and in the industrial zones south of the Metrolink rail lines.

Spills reported in recent years have generally involved petroleum products, chemical solvents, and other industrial substances. While many incidents have been relatively small in scale and quickly contained, they underscore the ongoing risk posed by hazardous materials in urban environments. Releases have occurred during routine operations, equipment failures, and transportation mishaps, including along major arterial roadways and active rail corridors such as the BNSF Railway, which transports hazardous freight through Fullerton. These incidents have the potential to impact air and water quality, disrupt local services, and pose health risks to nearby populations.

No federally declared disasters relating to hazardous materials have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

TERRORISM/CYBERSECURITY/ACTIVE SHOOTER

The City of Fullerton has not experienced any documented terrorist attacks in recent history. While Fullerton is part of a densely populated and strategically significant region in Southern California, no incidents meeting federal definitions of terrorism have occurred within the city limits. Nonetheless, the potential for terrorism—whether domestic or international—remains a concern due to Fullerton's proximity to major transportation corridors, public gathering spaces, and critical infrastructure.

In terms of cybersecurity, Fullerton has not reported any major cyberattacks targeting municipal systems. However, regional agencies serving Fullerton have experienced significant incidents. Notably, the Orange County Transportation Authority (OCTA), which provides transit services throughout the county, was the victim of a cyberattack in 2016. The breach disabled dozens of servers, including email and voicemail systems, and cost over $600,000 in recovery efforts. Fortunately, transportation services continued uninterrupted, and no sensitive personal data was compromised.[100] This event highlights the vulnerability of interconnected public systems and the importance of robust cybersecurity protocols across all levels of government and service providers.

[100] Voice of OC, *Transportation Authority Kept Secret Cyber Attacker That Cost $600,000*, https://voiceofoc.org/2024/06/santana-cyber-attacking-your-right-to-know/#:~:text=Here%20in%20Orange%20County%2C%20we%20have%20some%20experience,cybersecurity%20dealings%20with%20large%20agencies.&text=And%20thanks%20to%20the%20reporting,out%20computer%20servers%20for%20days., published August 2, 2016, accessed September 17, 2025.

Regarding active shooter incidents, Fullerton has experienced isolated events involving firearms in public spaces, though none have met the federal threshold for mass casualty active shooter classification. Given the city's population density, presence of educational institutions, and public venues, the risk remains present. Local law enforcement agencies continue to engage in preparedness training and community outreach to mitigate this threat.

No federally declared disasters relating to terrorism, cybersecurity, or active shooter have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

CIVIL UNREST

The City of Fullerton has historically experienced instances of civil unrest and public demonstrations, often tied to broader social and political movements. While many of these events have remained peaceful, some have escalated into unlawful assemblies requiring law enforcement intervention. For example, In the spring of 1970, protests erupted at California State University, Fullerton (CSUF) in response to the Vietnam War, a visit from Governor Ronald Reagan, and the Kent State University shootings, ultimately leading Reagan to order the campus closed before final exams and resulting in over 60 arrests. Between 2011 and 2014, a series of protests followed the death of a homeless man involving Fullerton Police, culminating in violent demonstrations after the officers were acquitted, with 13 arrests, vandalism at a police station, and an assault on a news reporter. In 2017, clashes broke out at CSUF when a white supremacist speaker was invited to campus, leading to physical altercations, the use of pepper spray, and eight arrests by law enforcement.

More recently, in February 2025, pro-immigration protesters marched from Orangethorpe Avenue and Harbor Boulevard to downtown Fullerton and the Fullerton Police Department, blocking intersections and protesting. The demonstration was initially peaceful but was declared an unlawful assembly when protesters began obstructing traffic and access to public buildings. Law enforcement deployed SWAT and mounted units for crowd control and issued dispersal orders in accordance with California Penal Code Section 409.[101]

While Fullerton has not experienced large-scale riots or prolonged civil disturbances, civil unrest can occur within the city, particularly in response to politically sensitive issues. The city's active civic culture, diverse population, and proximity to regional protest movements suggest that future occurrences remain possible, especially during periods of heightened social tension.

No federally declared disasters relating to civil unrest have occurred including the planning area within the last five years; refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area**.

---

101 Daily Titan, *Pro-immigration protesters block downtown Fullerton*, https://dailytitan.com/news/pro-immigration-protesters-block-downtown-fullerton/article_7329de14-e779-11ef-ab88-67fb443a7b40.html, accessed September 17, 2025.

VECTOR-BORNE DISEASE AND PANDEMIC

In December 2019, the Covid-19 pandemic began in Wuhan, China before becoming a global pandemic that would infect over 775 million people and claim the lives of over 7 million.[102] The entire population of the City of Fullerton was impacted by this event, and the City was included in the federal disaster declaration issued for this hazard event by FEMA.

Fullerton experienced significant impacts from the Covid-19 Pandemic. By March 2020, Governor Gavin Newsom issued a statewide stay at home order, prohibiting all people in the State of California from leaving their homes apart from essential services and limiting the operations of non-essential businesses.

At the time this document was prepared, 8,928 known deaths in Orange County have been attributed to Covid-19.[103] As part of the response to slow the spread of the virus, non-essential businesses and schools were closed or transitioned to remote environments, if feasible. A significant milestone and improvement against the pandemic came in December of 2020 with the release of the Covid-19 vaccine. The City of Fullerton and County of Orange made various resources available based on guidance from the WHO, CDC, and California Department of Public Health (CDPH). Mask mandates were issued for indoor spaces, and proof of vaccination requirements were established for certain activities to help stop transmission. Generally, the pandemic resulted in significant economic and public health impacts that reverberated throughout the City. At the time of this writing, Covid-19 is a seasonally recurring issue as vaccines, masks, and social distancing has made disease transmission and treatment much more manageable.

Before Covid-19, the most recent pandemic occurred in 2009: the (H1N1) pdm09, "swine flu" pandemic.[104] H1N1pdm09 primarily affected children and young/middle-aged adults, atypical from most influenza pandemics. Between April 2009 and April 2010, the CDC estimates over 60 million cases, nearly 275,000 hospitalizations, and over 12,000 deaths affected the United States population. The World Health Organization declared an end to the global pandemic in August 2010; however, the virus continues to circulate as a seasonal influenza virus.[105] In Orange County, the local impact was significant, with 226 severe cases and 57 fatalities tracked by the Orange County Health Care Agency (OCHCA).[106]

---

[102] World Health Organization, *WHO Covid-19 Dashboard*, https://data.who.int/dashboards/Covid19/deaths?n=o, accessed September 17, 2025.
[103] OC Healthcare Agency, *Orange County Covid-19 Dashboard*, https://www.ochealthinfo.com/services-programs/disease-prevention/diseases-conditions/covid-19-resources, accessed September 17, 2025.
[104] CDC, *CDC H1N1 Flu: Origin of 2009 H1N1 Flu (Swine Flu)*, https://archive.cdc.gov/#/details?url=https://www.cdc.gov/h1n1flu/information_h1n1_virus_qa.htm, 2009, accessed September 17, 2025.
[105] CDC, *Influenza Pandemics of the 20th Century*, https://stacks.cdc.gov/view/cdc/16102, accessed September 17, 2025.
[106] Orange County Health Care Agency, *Response to Pandemic H1N1 2009 Influenza*, https://www.ochealthinfo.com/sites/hca/files/import/data/files/13257.pdf, accessed September 23, 2025.

Historically, other influenza pandemics have also left a profound mark. Both the 1968 and 1918 pandemics were caused by avian flu outbreaks. The 1968 pandemic was caused by an influenza H3N2 virus, with an estimated death toll of 116,000 in the United States and an estimated worldwide toll of 1.1 million.[107] Medical advances in the 1960s including antiviral medications and expanded influenza vaccine options significantly helped to combat this pandemic. The 1918 pandemic was an outbreak of influenza caused by an H1N1 virus. The virus spread worldwide from 1918-1919. It is estimated that one third of the worldwide population at the time, about 500 million people, became infected with the virus. The pandemic resulted in an estimated 675,000 deaths in the United States alone and over 50 million deaths worldwide.[108]

Beyond influenza, vector-borne diseases and epidemics have periodically affected Fullerton and the broader Southern California region. A hepatitis A outbreak that began in San Diego County in 2016 spread to Santa Cruz, Los Angeles, and Monterey counties, primarily impacting homeless populations and individuals who use drugs. In response, Governor Brown issued an emergency proclamation in 2017 to boost vaccine supply.[109] In 2015, a measles outbreak linked to Disneyland in Anaheim underscored the risks of low vaccination rates, with 49 cases among unvaccinated individuals. By 2016, the outbreak had been resolved.[110] West Nile Virus also posed a regional threat, peaking in 2014 with nearly 280 reported cases in Orange County before declining to 97 cases in 2015 and just 12 by 2018.[111]

In the last five years, two FEMA-declared disasters for the pandemic hazard have affected the planning area:

- EM-3428-CA: Covid-19 Pandemic – January 20, 2020
- DR-4482-CA: Covid-19 Pandemic – January 20, 2020

Refer to **Table 4-30: Summary of Declared Disasters Affecting the Planning Area** for a full list of federally declared disasters affecting the planning area.

4.11.4 PROBABILITY OF FUTURE OCCURRENCES

AIRCRAFT/TRANSPORTATION/TRAIN INCIDENTS

Given the City of Fullerton's extensive transportation infrastructure and history of incidents, the probability of future transportation-related hazards is a concern. The LHMP Planning Team has determined the probability of occurrence for this hazard to be highly likely. Fullerton is intersected by major arterial highways and freeways such as State Routes 90, 91, and 57, and Interstate 5, which serve as critical evacuation routes but also pose risks for hazardous material spills, multi-vehicle collisions, and traffic disruptions. The city's dense population and

---

[107] Ibid.
[108] Ibid.
[109] CDC, *Homelessness and Hepatitis A—San Diego County, 2016–2018*, https://stacks.cdc.gov/view/cdc/153467, accessed September 23, 2025.
[110] CDC, *Measles Outbreak — California, December 2014–February 2015*, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6406a5.htm, accessed September 23, 2025.
[111] Orange County Health Care Agency, *West Nile Virus, Orange County 2011 – 2018*, https://ochealthinfo.com/sites/hca/files/import/data/files/102025.pdf, accessed September 23, 2025.

mixed land uses further increase the likelihood that any transportation incident could have cascading impacts on mobility, emergency response, and public safety.

Rail infrastructure adds another layer of risk. The Fullerton Transportation Center, located in the heart of downtown, is a major hub for Metrolink, Amtrak, and freight services operated by BNSF and Union Pacific. These rail lines traverse residential, commercial, and industrial zones, increasing the potential for derailments, collisions, and hazardous material releases. Notably, BNSF Railway is known to transport hazardous substances through the city, which heightens the risk of high-impact incidents along rail corridors.

Aircraft-related hazards, while less frequent than other transportation incidents, remain a concern for the City of Fullerton due to the presence of the Fullerton Municipal Airport and the city's location within regional airspace used by nearby commercial airports.

Considering the city's multimodal transit environment, history of incidents, and proximity to regional airspace and freight corridors, future transportation-related hazards are considered highly likely, indicating a 90 to 100 percent chance of occurrence within the next year or a recurrence interval of less than one year.

HAZARDOUS MATERIALS RELEASE/SPILL

Hazardous materials use, storage, and transport will continue to be a routine part of operations across the City of Fullerton, and as such, the potential for future hazardous materials incidents remains an ongoing concern. The probability of occurrence for this hazard has been determined by the LHMP Planning Team to be highly likely. Fullerton's industrial land uses—particularly in the southern, western, and northern portions of the city—host a concentration of facilities that generate and manage hazardous substances, many of which are tracked through the EPA Biennial Report, GeoTracker, and EnviroStor databases. These include active Cleanup Program sites, Leaking Underground Storage Tank (LUST) sites, and various federal and state-regulated cleanup efforts. Additionally, hazardous materials are transported through the city via major arterial roadways and active rail corridors, including the BNSF Railway, which increases the risk of mobile incidents. Despite these concentrations, hazardous materials incidents could occur anywhere in the city, including at small businesses, schools, and residential properties where regulated substances are used in smaller quantities.

Federal, state, and local agencies implement a range of policies and regulations to mitigate the risk of hazardous materials releases. The City of Fullerton participates in Orange County's household hazardous waste disposal program, which provides residents with access to regional collection centers in Anaheim, Huntington Beach, Irvine, and San Juan Capistrano. Additionally, hazardous materials handling and reporting are overseen by the local Certified Unified Program Agency (CUPA), which enforces compliance with California Environmental Protection Agency standards. While these preventative measures significantly reduce the likelihood of large-scale incidents, the presence of diverse industries and active transportation corridors means that spills, leaks, or accidental releases remain a possibility. Based on current conditions and regulatory oversight, the probability of future hazardous materials incidents in Fullerton is considered highly likely, indicating a 90 to 100 percent likelihood of occurrence within the next year or a recurrence interval of less than one year.

TERRORISM/CYBERSECURITY/ACTIVE SHOOTER

Terrorism threats are inherently unpredictable and can occur without warning in any part of the city. Fullerton's diverse and densely populated environment—including government facilities, educational institutions, commercial centers, and transit hubs—creates a range of potential targets for intentional acts of violence or disruption. While Fullerton does not host high-profile federal or military installations, it contains numerous locations where people gather, making it vulnerable to localized incidents of civil disturbance or targeted violence.

Cybersecurity threats are particularly relevant in Fullerton due to the widespread use of digital infrastructure across public and private sectors. Government agencies, healthcare providers, financial institutions, educational campuses such as California State University, Fullerton, and utility services all rely on interconnected systems that could be targeted by cyberattacks. The increasing sophistication of cyber threats and the city's reliance on technology for essential services elevate the risk of data breaches, service disruptions, and economic impacts.

Active shooter incidents, though statistically rare, remain a concern in urban settings like Fullerton. Locations such as schools, shopping centers, transit stations, and entertainment venues are particularly vulnerable due to high foot traffic and public accessibility. The Fullerton Police Department and other local agencies engage in preparedness efforts, including training, threat assessments, and community outreach, to reduce risk and improve response capabilities. Nonetheless, the dynamic nature of these threats means that future occurrences cannot be ruled out, and the city must remain vigilant in its prevention and mitigation strategies.

The probability of terrorism, cybersecurity threats, and active shooter threats has been determined by the LHMP Planning Team to be highly likely. A highly likely probability means a 90 to 100 percent chance of occurrence within the next year or a recurrence interval of less than one year.

CIVIL UNREST

Civil unrest incidents occur across the country and globally for a wide range of political, social, economic, and environmental reasons. In the current climate, it is reasonable to expect that lawful protests and public demonstrations will continue in the City of Fullerton, as these activities are protected under the First Amendment. However, peaceful assemblies can escalate into civil disturbances under certain conditions, making it difficult to predict when law enforcement intervention may be required. The LHMP Planning Team has determined the probability of civil unrest in Fullerton to be highly likely, reflecting a 90 to 100 percent likelihood of occurrence within the next year or a recurrence interval of less than one year.

Fullerton's urban environment includes several locations where people commonly gather, such as City Hall, the Fullerton Transportation Center, California State University, Fullerton, and the downtown commercial district. These areas are more likely to serve as focal points for demonstrations and public discourse. The presence of law enforcement at planned events is a standard preemptive measure, and increased intelligence gathering and situational awareness can help mitigate the risk of escalation. Nonetheless, the unpredictable nature of civil unrest—often tied to broader societal movements—means that incidents could occur

anywhere in the city and affect both public and private property. Given Fullerton's diverse population, active civic culture, and regional connectivity, the city remains moderately vulnerable to future episodes of civil disturbance. Continued coordination between public safety agencies, community organizations, and local leadership will be essential to maintaining public order and ensuring safe expression of civil liberties.

VECTOR-BORNE DISEASE AND PANDEMIC

The probability of future vector-borne disease outbreaks or pandemic events in the City of Fullerton has been determined by the LHMP Planning Team to highly likel. The likelihood of such occurrences has increased in recent decades due to a combination of global and local factors, including increased international travel, urbanization, climate change, and changes in land use. Fullerton's dense population, active transit systems, and proximity to major regional airports make it particularly susceptible to rapid disease transmission once an outbreak begins. Additionally, the city's parks, greenbelts, and urban runoff systems provide favorable conditions for vectors such as mosquitoes and rodents, which can carry diseases like West Nile virus, dengue, and hantavirus.

Pandemics, by nature, are difficult to predict in terms of timing and origin. Future pandemic events are likely to result from viral mutations that produce novel pathogens to which the population has little or no immunity. While advances in medical technology and global surveillance systems have improved the ability to detect and respond to emerging diseases, entirely preventing pandemics remains unlikely. Vector-borne diseases also pose a persistent threat, particularly in outdoor environments and areas with poor drainage or unmanaged waste. Vulnerable populations—including the elderly, immunocompromised individuals, and those in overcrowded housing—are at greater risk of severe outcomes.

Given these conditions, the probability of future vector-borne disease or pandemic events in Fullerton is considered highly likely, indicating a 90 to 100 percent chance of occurrence in the next year or a recurrence interval of less than one year. Continued investment in public health infrastructure, community education, and emergency preparedness will be essential to mitigating the impacts of future outbreaks.

4.11.5 CLIMATE CHANGE

AIRCRAFT/TRANSPORTATION/TRAIN INCIDENTS

Climate change can impact the stability and safety of transportation infrastructure, increasing the risk of incidents involving railroads, aircraft, and other transit systems. Extreme heat can cause rail tracks to expand and buckle—known as "sun kinks"—which may lead to train

derailments.[112] Similarly, prolonged drought can dry out and destabilize soils beneath tracks, while intense rainfall and flooding can erode the ground and wash out rail beds.[113] For aviation, extreme weather events such as high winds, heatwaves, and sudden storms can disrupt flight operations, reduce visibility, and increase the risk of accidents. As climate change intensifies these conditions, Fullerton's transportation systems face growing challenges that require proactive planning and infrastructure resilience.

HAZARDOUS MATERIALS RELEASE/SPILL

Accidental hazardous materials releases are usually caused by human error, unrelated with climate change. However, hazardous materials releases can be a secondary impact as a result of infrastructure failure during a natural hazard event, such as a wildfire or severe storm. Climate change could cause an increase in destructive natural hazards in the City and surrounding region, and thus risk future hazardous materials spills. Further, hazardous materials releases during wildfire or severe weather events could spread contamination to large geographic areas and amplify long-term impacts to human and ecological health. Spills or releases in challenging clean-up conditions can result in more severe damage or impacts compared to spills during normal conditions.

TERRORISM/CYBERSECURITY/ACTIVE SHOOTER

As terrorism, cyberattacks and active shooter scenarios are human caused, these types of hazards are not directly tied to climate change impacts. However, the interaction of natural hazards and global climate change could increase the frequency and severity of events. Significant and prolonged climate change impacts can cause conflicts regarding natural resources and livelihood insecurity, as well as food insecurity or water scarcity. Terrorist organizations could operate more easily in fragile and conflict-affected environments, according to the Climate Diplomacy Organization.[114]

CIVIL UNREST

Similar to terrorism and cyber-attack, civil unrest is a human-caused hazard and is not directly tied to climate change impacts. However, environmental concerns and climate change implications could drive conflict on a local, regional, or global scale. Academic research has connected climate change influenced droughts to periods of societal unrest over the course of many centuries. Research from Columbia University links climate change and unprecedented drought as the key societal stressor that led to uprisings and initiated the

---

[112] Climate Central, *Derailments May Increase as 'Sun Kinks' Buckle Tracks*, https://www.climatecentral.org/news/climate-change-warp-railroad-tracks-sun-kinks-17470, accessed September 11, 2025.
[113] Edwards, F.L., Goodrich, D.C. *Climate Change-Related Threats to Railroads: Implications for Threat, Hazard and Risk Assessment*, September 4, 2025.
[114] Climate Diplomacy Organization, *Insurgency, Terrorism and Organized Crime in a Warming Climate*, https://www.climate-diplomacy.org/publications/insurgency-terrorism-and-organised-crime-warming-climate, accessed September 11, 2025.

Syrian Civil War.[115] Vulnerability associated with limited resources can make periods of civil unrest more likely to occur in the future. Additionally, more and more demonstrations are centered around the environment and climate change. As climate change continues, protests and demonstrations may become more extreme, escalating to civil unrest.

VECTOR-BORNE DISEASE & PANDEMIC

Climate change is intensifying the risk of vector-borne diseases and future pandemics by altering ecosystems and increasing human exposure to disease-carrying organisms. Warmer temperatures, shifting precipitation patterns, and more frequent flooding create ideal conditions for vectors such as mosquitoes and ticks to thrive and expand into new regions, increasing the transmission of diseases like dengue, West Nile virus, and Lyme disease.[116] At the same time, climate-driven habitat loss and species migration are forcing wild animals—especially bats, which are known reservoirs for novel viruses—into closer contact with human populations. This increases the likelihood of viral spillover events, where pathogens jump from animals to humans, potentially sparking new pandemics.[117] As climate change continues to reshape environmental conditions, public health systems must adapt to address both the growing threat of vector-borne illnesses and the heightened risk of global disease emergence.

4.11.6 VULNERABILITY ASSESSMENT

Human-caused hazards such as aircraft incidents, transportation and train accidents, hazardous materials releases, terrorism, cybersecurity threats, active shooter events, civil unrest, vector-borne disease outbreaks, and pandemics are not geographically confined and may occur anywhere within the City of Fullerton. Therefore, a conservative planning approach assumes that the entire City is potentially vulnerable to these threats. This includes all 167 critical facilities, 69 facilities of concern, 47,484 occupied housing units, and the entire population of 141,278 residents.

While certain areas may face elevated risk due to their proximity to specific infrastructure — such as the Fullerton Municipal Airport, the Amtrak, Metrolink, and freight rail lines, or industrial corridors near Orangethorpe Avenue — the potential impacts of human-caused hazards could extend citywide. Critical facilities such as government buildings, emergency service providers, community centers, parks, utilities, and transportation infrastructure may be directly or indirectly affected. Facilities of concern, including schools, healthcare and assisted living centers, and other community services, are also vulnerable.

Potential impacts vary by hazard but may include:

---

[115] Columbia University, *Can studying climate change help predict civil unrest*, https://giving.columbia.edu/can-studying-climate-change-help-predict-civil-unrest, accessed September 11, 2025.
[116] CDC, *Vector-Borne Diseases*, https://www.cdc.gov/climate-health/php/effects/vectors.html, accessed September 11, 2025.
[117] US National Science Foundation, *Study finds that climate change could spark the next pandemic,* https://www.nsf.gov/news/study-finds-climate-change-could-spark-next, accessed September 11, 2025.

Transportation and Aircraft Incidents: These could result in injuries, fatalities, and damage to nearby structures or infrastructure. Train accidents involving hazardous materials may trigger evacuations, health risks, and environmental contamination.

Hazardous Materials Releases: Spills or leaks could compromise water and power systems, harm natural resources, and require complex cleanup operations. Residents and businesses may face health risks and economic disruption.

Terrorism, Cybersecurity, and Active Shooter Events: These threats may target public spaces, schools, infrastructure, or government assets, leading to casualties, property damage, and long-term service disruptions. Cyberattacks could cripple communications, utilities, and emergency response systems.

Civil Unrest: Protests or disturbances may concentrate around government buildings or downtown areas, posing risks to businesses and public safety. Escalated events could result in vandalism, looting, or arson.

Vector-Borne Disease and Pandemic: These public health hazards can spread rapidly across densely populated areas, straining medical facilities and disrupting daily life. Economic impacts may include reduced tourism, business closures, and workforce shortages.

Given the scale and unpredictability of human-caused hazards, it is essential to adopt a citywide mitigation strategy that prioritizes resilience across all sectors. Protecting critical infrastructure, supporting vulnerable populations, and enhancing emergency preparedness will be key to minimizing the impacts of these threats and ensuring Fullerton's ability to respond and recover effectively.

4.11.7 CHANGES IN VULNERABILITY (PREVIOUS FIVE YEARS/NEXT FIVE YEARS)

Since the 2020 LHMP, the City of Fullerton has experienced less than one percent population growth and a 4.2 percent increase in housing units, primarily through residential infill, mixed-use redevelopment, and rehabilitation of existing structures. Human-caused hazards such as hazardous materials release/spill, terrorism, cybersecurity threats, active shooter incidents, civil unrest, vector-borne disease, and pandemic are considered non-mapped hazards and have the potential to impact the entire city. As such, any increase in population or development—regardless of location—contributes to a marginal rise in vulnerability to these hazards. Transportation and train-related incidents present a more localized risk, particularly around the Fullerton Transportation Center and along active rail corridors. These areas have historically supported commercial and industrial land uses, some of which may have been redeveloped or intensified under recent infill and mixed-use projects, slightly increasing exposure to transportation-related hazards.

Over the next five years, Fullerton is expected to accommodate substantial residential growth to meet its RHNA allocation of 13,209 housing units by 2029. Much of this development is anticipated within the HIOZ, which includes 759 parcels concentrated along Commonwealth Avenue, South Harbor Boulevard, East Valencia Drive, and other corridors. These areas are located near existing transportation infrastructure, including the Fullerton Transportation Center and active rail lines served by Metrolink, Amtrak, BNSF, and Union Pacific. As these

corridors experience increased residential and mixed-use development, vulnerability to transportation and train-related incidents may rise due to greater population density and proximity to high-traffic transit hubs. Additionally, because other human-caused hazards—such as hazardous materials release, terrorism, cybersecurity threats, civil unrest, and public health emergencies—can affect the entire city, future growth will contribute to a broader increase in exposure across Fullerton.

In summary, vulnerability to human-caused hazards in Fullerton has increased slightly over the past five years due to modest population and development growth. Looking ahead, planned development under the HIOZ program, particularly near transportation corridors, may elevate exposure to train and transit-related incidents. Meanwhile, citywide hazards such as hazardous materials release, terrorism, civil unrest, and public health threats will continue to pose risks to all areas of Fullerton. As the city grows, it will be important to integrate emergency preparedness, public safety planning, and infrastructure resilience into future development efforts to mitigate the impacts of human-caused hazards.

4.11.8 LIMITED ADAPTIVE CAPACITY AND AFN POPULATIONS

Section 3.8, *Whole Community and Access and Functional Needs*, includes a detailed determination of vulnerable populations within the planning area, including those with AFN or limited adaptive capacity. Human-caused hazards—including aircraft, transportation, and train incidents; hazardous materials release or spill; terrorism, cybersecurity threats, and active shooter events; civil unrest; vector-borne disease; and pandemic—have the potential to impact any area within the City of Fullerton. As such, the entire city is considered potentially vulnerable to these hazards, including all census tracts formally designated as having high concentrations of limited adaptive capacity and AFN populations: Census Tracts 001404, 001801, 001802, 086701, 011000, 001902, 011601, 011602, 011403, 011502, 011504, and 011711. Additionally, limited adaptive capacity and AFN populations are understood to reside throughout the City, beyond the boundaries of these designated tracts.

Vulnerable groups—including older adults, individuals with disabilities, linguistically isolated households, and residents in multi-unit, crowded households or group housing—face distinct challenges during human-caused hazard events. Older Adults may experience difficulty evacuating or responding quickly to sudden emergencies such as transportation accidents, hazardous material spills, or active shooter events. They are also more susceptible to health complications during pandemics or vector-borne disease outbreaks, and may rely on caregivers or medical equipment that could be disrupted by civil unrest or cybersecurity failures. Individuals with Disabilities may face barriers to mobility, communication, and access to emergency services during fast-moving or chaotic events. Those dependent on powered medical devices or assistive technologies are especially vulnerable during infrastructure disruptions or cybersecurity incidents that affect healthcare systems. Linguistically Isolated Households may not receive or understand emergency alerts, evacuation instructions, or public health guidance during events such as hazardous material releases, civil unrest, or pandemics. Language barriers can delay protective actions and reduce access to critical resources. Residents in multi-unit, crowded households or group quarters are at elevated risk due to building density, limited escape routes, and shared infrastructure. These conditions can

exacerbate exposure during transportation incidents, hazardous material spills, or infectious disease outbreaks, and may complicate evacuation or shelter-in-place efforts.

Considerations for vulnerable groups throughout the planning area were incorporated into the mitigation strategy in Section 5. Specifically, the LHMP Planning Team tailored Mitigation Actions 1, 3, 11, 18 and 39 with these groups in mind, including efforts to improve multilingual emergency communications, strengthen cybersecurity protections for critical services, enhance public health outreach, and support evacuation planning and continuity of care for AFN populations during human-caused hazard events.

4.12 SUMMARY OF DECLARED DISASTERS AFFECTING THE PLANNING AREA

As required by the recently updated FEMA policy guidelines, a summary of federally declared disasters and state declared disasters specifically affecting the planning area within the last five years is included below as **Table 4-30**. Specific effects are also outlined in the hazard profiles, previous occurrences sections (where applicable).

TABLE 4-30: SUMMARY OF DECLARED DISASTERS AFFECTING THE PLANNING AREA

DECLARATION DATE	DISASTER NUMBER	INCIDENT SUBCATEGORY	INCIDENT DESCRIPTION	EFFECT ON PLANNING AREA
Federally Declared Disasters				
January 20, 2020	DR-4482-CA	Biological	Covid-19 Pandemic	See EM-3428 below
January 20, 2020	EM-3428-CA	Biological	Covid-19	The COVID-19 pandemic, began in December 2019 leading to significant health, social, and economic disruptions. As of 2024, Orange County has confirmed over 550,000 cases and nearly 7,000 deaths due to COVID-19.
October 26, 2020	FM-5381-CA	Fire	Blue Ridge Fire	Fullerton experienced air quality issues, ash and potential evacuation.
October 26, 2020	FM-5380-CA	Fire	Silverado Fire	Fullerton experienced air

DECLARATION DATE	DISASTER NUMBER	INCIDENT SUBCATEGORY	INCIDENT DESCRIPTION	EFFECT ON PLANNING AREA
				quality issues, ash and potential evacuation.
December 3, 2020	FM-5383-CA	Fire	Bond Fire	Fullerton experienced air quality issues, ash and potential evacuation.
January 8, 2023	EM-3591-CA	Flood	Severe Winter Storms, Flooding, and Mudslides	Fullerton experienced heavy rain and localized flooding during this storm.
March 9, 2023	EM-3592-CA	Flood	Severe Winter Storms, Flooding, Landslides, and Mudslides	Fullerton experienced heavy rain and localized flooding during this storm.
State Declared Disasters				
February 2024	146	Winter Storms	Severe Winter Storms	Fullerton experienced heavy rain and localized flooding during this storm.
August 2023	142	Tropical Storm	Tropical Stom Hilary	Fullerton experienced heavy rain and localized flooding during this storm.
February 2023 to March 2023	141	Winter Storms	Severe Winter Storms	Fullerton experienced heavy rain and localized flooding during this storm.
December 2022 to January 2023	140	Winter Storms	Severe Winter Storms	Fullerton experienced heavy rain and localized

DECLARATION DATE	DISASTER NUMBER	INCIDENT SUBCATEGORY	INCIDENT DESCRIPTION	EFFECT ON PLANNING AREA
				flooding during this storm.
December 2021	127	Winter Storms	December Winter Storms	Fullerton experienced heavy rain and localized flooding during this storm.

4.13 SUMMARY OF VULNERABILITY

Table 4-30: Risk Assessment Summary Table shows a summary of critical facilities and facilities of concern that are vulnerable to identified hazards. For mapped hazards including flood, landslide, liquefaction and wildfire, assets that are located within mapped hazard zones are considered vulnerable. These are marked with a "Y" and a red-shaded cell to note that they are vulnerable. Assets that are not located in mapped hazard zones, and thus not vulnerable, are marked with a "N" and a green-shaded cell. For security purposes, some assets were not mapped. These assets are marked as "N/A" for mapped hazards. Additionally, some hazards are considered to apply to the entire City, including all critical facilities and facilities of concern. These hazards include dam failure, extreme weather, land subsidence, fault rupture and ground shaking, and human-caused hazards. For these hazards, all assets are considered vulnerable and marked with a "Y" and a red-shaded cell.

TABLE 4-31: RISK ASSESSMENT SUMMARY TABLE

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Critical Facilities									
City Hall	Y	Y	Y	N	Y	Y	Y	N	Y
City Yard	Y	Y	Y	N	Y	Y	Y	N	Y
Fire Station 1	Y	N	Y	N	Y	Y	Y	N	Y
Fire Station 2	Y	Y	Y	N	Y	Y	Y	N	Y
Fire Station 3	Y	Y	Y	N	Y	Y	N	N	Y
Fire Station 4	Y	N	Y	N	Y	Y	N	N	Y
Fire Station 5	Y	Y	Y	N	Y	Y	Y	N	Y
Fire Station 6	Y	N	Y	N	Y	Y	Y	Y	Y
Police Station	Y	Y	Y	N	Y	Y	Y	N	Y
Garnet Community Center	Y	Y	Y	N	Y	Y	N	N	Y
Maple Community Center	Y	Y	Y	N	Y	Y	Y	N	Y
Richman Community Center	Y	Y	Y	N	Y	Y	Y	N	Y
Main Library	Y	Y	Y	N	Y	Y	Y	N	Y
Gilbert Community Center	Y	Y	Y	N	Y	Y	Y	N	Y
Amerige Park	Y	Y	Y	N	Y	Y	Y	N	Y
Brea Dam Park	Y	N	Y	N	Y	Y	N	N	Y
Fullerton Museum Center	Y	Y	Y	N	Y	Y	Y	N	Y
St Jude Medical Center	Y	N	Y	N	Y	Y	N	N	Y
Fullerton Community Center	Y	Y	Y	N	Y	Y	Y	N	Y
Fullerton Tennis Center	Y	N	Y	N	Y	Y	Y	N	Y
Independence Park	Y	Y	Y	N	Y	Y	Y	N	Y
Laguna Lake Park	Y	N	Y	N	Y	Y	Y	Y	Y
Fullerton Airport	Y	Y	Y	N	Y	Y	Y	N	Y
Transportation Center	Y	N	Y	N	Y	Y	Y	N	Y
Bridge 55C0147	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0290	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0292	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0288	Y	Y	Y	N	Y	Y	Y	N	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Bridge 55C0293	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0291	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0224	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0228	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0226	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0225	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0227	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0229	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0386	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0230	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0120	Y	N	Y	Y	Y	Y	Y	N	Y
Bridge 55C0346	Y	Y	Y	N	Y	Y	N	N	Y
Bridge 55C0289	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0602	Y	N	Y	N	Y	Y	Y	N	Y
Bridge 55C0638	Y	N	Y	N	Y	Y	N	N	Y
Bridge 55C0584	Y	N	Y	N	Y	Y	N	N	Y
Bridge 55C0233	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0231	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0235	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0294	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0243	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0242	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0244	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0234	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0418	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0703	Y	Y	Y	N	Y	Y	N	N	Y
Bridge 55C0297	Y	N	Y	N	Y	Y	N	N	Y
Bridge 55C0298	Y	N	Y	N	Y	Y	N	N	Y
Bridge 55C0296	Y	Y	Y	N	Y	Y	N	N	Y
Bridge 55C0387	Y	N	Y	N	Y	Y	N	N	Y
Bridge 55C0345	Y	N	Y	N	Y	Y	N	N	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Bridge 55C0586	Y	N	Y	N	Y	Y	N	N	Y
Bridge 55C0384	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0308	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0236	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0526	Y	N	Y	N	Y	Y	N	Y	Y
Bridge 55C0232	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0263	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0585	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0310	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0311	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0312	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0664	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0383	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0385	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0309	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0307	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0295	Y	Y	Y	N	Y	Y	Y	N	Y
Bridge 55C0525	Y	N	Y	N	Y	Y	Y	N	Y
Bridge 55C0685	Y	Y	Y	N	Y	Y	N	N	Y
Bridge 55C0681	Y	N	Y	N	Y	Y	N	N	Y
Coyote Pump Station (1)	Y	N	Y	N	Y	Y	N	N	Y
Coyote Pump Station (2)	Y	N	Y	N	Y	Y	N	N	Y
Coyote Pump Station (3)	Y	N	Y	N	Y	Y	N	N	Y
Coyote Reservoir	Y	N	Y	N	Y	Y	N	N	Y
Hawks Point Pump Station (1)	Y	N	Y	Y	Y	Y	N	Y	Y
Hawks Point Pump Station (2)	Y	N	Y	Y	Y	Y	N	Y	Y
Hawks Pointe Reservoir	Y	N	Y	Y	Y	Y	Y	Y	Y
Hermitage Pump Station (1)	Y	N	Y	N	Y	Y	Y	Y	Y
Hermitage Pump Station (2)	Y	N	Y	N	Y	Y	Y	Y	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Hermitage Pump Station (3)	Y	N	Y	N	Y	Y	Y	Y	Y
Hermitage Pump Station (4)	Y	N	Y	N	Y	Y	Y	Y	Y
Hermitage Pump Station (5)	Y	N	Y	N	Y	Y	N	Y	Y
Hermitage Reservoir	Y	N	Y	N	Y	Y	Y	Y	Y
Hillcrest Pump Station (1)	Y	N	Y	N	Y	Y	N	N	Y
Hillcrest Pump Station (2)	Y	N	Y	N	Y	Y	N	N	Y
Hillcrest Reservoir	Y	N	Y	Y	Y	Y	N	N	Y
Kimberly2 Pump Station (1)	Y	Y	Y	N	Y	Y	N	N	Y
Kimberly2 Pump Station (2)	Y	Y	Y	N	Y	Y	N	N	Y
Kimberly2 Pump Station (3)	Y	Y	Y	N	Y	Y	N	N	Y
Laguna Pump Station (2)	Y	N	Y	N	Y	Y	N	Y	Y
Laguna Pump Station(1)	Y	N	Y	N	Y	Y	N	Y	Y
Laguna Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Las Palmas Pump Station (1)	Y	N	Y	Y	Y	Y	N	Y	Y
Las Palmas Pump Station (2)	Y	N	Y	Y	Y	Y	N	Y	Y
Las Palmas Reservoir	Y	N	Y	Y	Y	Y	N	Y	Y
Lower Acacia Pump Station (1)	Y	N	Y	N	Y	Y	N	N	Y
Lower Acacia Pump Station (2)	Y	N	Y	N	Y	Y	N	N	Y
Lower Acacia Pump Station (3)	Y	N	Y	N	Y	Y	N	N	Y
Lower Acacia Pump Station (4)	Y	N	Y	N	Y	Y	N	N	Y
Lower Acacia Pump Station (5)	Y	N	Y	N	Y	Y	N	N	Y
Lower Acacia Pump Station (6)	Y	N	Y	N	Y	Y	N	N	Y
Lower Acacia Reservoir	Y	N	Y	N	Y	Y	N	N	Y
Main Plant Pump Station (1)	Y	Y	Y	N	Y	Y	N	N	Y
Main Plant Pump Station (2)	Y	Y	Y	N	Y	Y	N	N	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Main Plant Pump Station (3)	Y	Y	Y	N	Y	Y	N	N	Y
Main Plant Pump Station (4)	Y	Y	Y	N	Y	Y	N	N	Y
Main Plant Pump Station (5)	Y	Y	Y	N	Y	Y	N	N	Y
Main Plant Reservoir	Y	Y	Y	N	Y	Y	N	N	Y
State College Pump Station (1)	Y	N	Y	N	Y	Y	N	Y	Y
State College Pump Station (2)	Y	N	Y	N	Y	Y	N	Y	Y
State College Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm Pump Station (1)	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm Pump Station (2)	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm-T1 Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm-T2 Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm-T3 Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm-T4 Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Tank Farm-T5 Reservoir	Y	N	Y	N	Y	Y	N	Y	Y
Upper Acacia Pump Station (1)	Y	N	Y	N	Y	Y	N	Y	Y
Upper Acacia Pump Station (2)	Y	N	Y	N	Y	Y	N	Y	Y
Upper Acacia Pump Station (3)	Y	N	Y	N	Y	Y	N	Y	Y
Upper Acacia Pump Station (4)	Y	N	Y	N	Y	Y	N	Y	Y
Upper Acacia-T1 Reservoir	Y	N	Y	Y	Y	Y	N	Y	Y
Upper Acacia-T2 Reservoir	Y	N	Y	Y	Y	Y	N	Y	Y
Kimberly Well 1A PFAS Water Treatment Plant	Y	Y	Y	N	Y	Y	Y	N	Y
Main Plant Treatment	Y	Y	Y	N	Y	Y	Y	N	Y
Southern California Edison	**Facility not mapped for security reasons**								
Southern California Edison	**Facility not mapped for security reasons**								

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Carbon Canyon Dam	**Facility not mapped for security reasons**								
Prado Dam	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0466	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0465	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0456	**Facility not mapped for security reasons**								
Caltrans Overhead Separation 55 0502r	**Facility not mapped for security reasons**								
Caltrans Connection Overhead 55 0503g	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0287	**Facility not mapped for security reasons**								
Caltrans Diversion Channel 55 0528	**Facility not mapped for security reasons**								
Caltrans Offramp Overhead 55 0472s	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0296l	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0296r	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0296f	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0464	**Facility not mapped for security reasons**								
Caltrans Undercrossing 55 0483	**Facility not mapped for security reasons**								
Caltrans Overhead Separation 55 0293l	**Facility not mapped for security reasons**								
Caltrans Overhead 55 0468	**Facility not mapped for security reasons**								

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Extraction Well (1)	**Facility not mapped for security reasons**								
Extraction Well (2)	**Facility not mapped for security reasons**								
Extraction Well (3)	**Facility not mapped for security reasons**								
Extraction Well (4)	**Facility not mapped for security reasons**								
Extraction Well (5)	**Facility not mapped for security reasons**								
Extraction Well (6)	**Facility not mapped for security reasons**								
Extraction Well (7)	**Facility not mapped for security reasons**								
Extraction Well (8)	**Facility not mapped for security reasons**								
Injection Well (1)	**Facility not mapped for security reasons**								
Injection Well (2)	**Facility not mapped for security reasons**								
Injection Well (3)	**Facility not mapped for security reasons**								
Injection Well (4)	**Facility not mapped for security reasons**								
Injection Well (5)	**Facility not mapped for security reasons**								
Facilities of Concern									
Buena Park High School	Y	Y	Y	N	Y	Y	Y	N	Y
Fullerton Union High School	Y	Y	Y	N	Y	Y	Y	N	Y
La Habra High School	Y	N	Y	N	Y	Y	N	N	Y
La Sierra High School	Y	Y	Y	N	Y	Y	N	N	Y
La Vista High School	Y	Y	Y	N	Y	Y	N	N	Y
Sonora High School	Y	N	Y	N	Y	Y	N	N	Y
Sunny Hills High School	Y	Y	Y	N	Y	Y	N	N	Y
Troy High School	Y	N	Y	N	Y	Y	N	N	Y
Acacia Elementary School	Y	N	Y	N	Y	Y	N	N	Y
Beechwood School	Y	N	Y	N	Y	Y	N	N	Y
Commonwealth Elementary School	Y	N	Y	N	Y	Y	N	N	Y
Fern Drive Elementary School	Y	N	Y	N	Y	Y	N	N	Y
Robert C. Fisler School	Y	N	Y	N	Y	Y	Y	N	Y
Golden Hill Elementary School	Y	N	Y	N	Y	Y	N	N	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Hermosa Drive Elementary School	Y	N	Y	N	Y	Y	N	N	Y
Ladera Vista Junior High School Of The Arts	Y	N	Y	N	Y	Y	N	N	Y
Laguna Road Elementary School	Y	N	Y	N	Y	Y	N	N	Y
Maple Elementary School	Y	Y	Y	N	Y	Y	Y	N	Y
Nicolas Junior High School	Y	Y	Y	N	Y	Y	Y	N	Y
Orangethorpe Elementary School	Y	Y	Y	N	Y	Y	Y	N	Y
Pacific Drive Elementary School	Y	Y	Y	N	Y	Y	Y	N	Y
Parks Jr High School	Y	N	Y	N	Y	Y	N	N	Y
Raymond Elementary School	Y	Y	Y	N	Y	Y	N	N	Y
Richman Elementary School	Y	Y	Y	N	Y	Y	Y	N	Y
Rolling Hills Elementary School	Y	N	Y	N	Y	Y	N	Y	Y
Sunset Lane Elementary School	Y	N	Y	N	Y	Y	Y	N	Y
Valencia Park Elementary School	Y	Y	Y	N	Y	Y	Y	N	Y
Woodcrest Elementary School	Y	Y	Y	N	Y	Y	Y	N	Y
California State University, Fullerton	Y	N	Y	N	Y	Y	N	N	Y
Fullerton College	Y	N	Y	N	Y	Y	N	N	Y
Hope University	Y	N	Y	N	Y	Y	N	N	Y
Marshall B. Ketchum University	Y	N	Y	N	Y	Y	Y	N	Y
Ruby Drive Elementary	Y	Y	Y	N	Y	Y	N	N	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Sierra Vista Elementary School	Y	N	Y	N	Y	Y	N	N	Y
Topaz Elementary School	Y	Y	Y	N	Y	Y	N	N	Y
Kids Adventure Learning Center	Y	Y	Y	N	Y	Y	Y	N	Y
Stepping Stones Academy	Y	N	Y	N	Y	Y	N	N	Y
St Juliana Falconieri School	Y	N	Y	N	Y	Y	N	N	Y
Arborland Montessori School - Valencia Campus	Y	Y	Y	N	Y	Y	Y	N	Y
Arborland Montessori School - Hughes Campus	Y	N	Y	N	Y	Y	N	N	Y
Ivycrest Montessori	Y	Y	Y	N	Y	Y	N	N	Y
Eastside Christian	Y	Y	Y	N	Y	Y	Y	N	Y
Rosary Academy	Y	N	Y	N	Y	Y	N	N	Y
James A. Whitaker Elementary	Y	Y	Y	N	Y	Y	Y	N	Y
Sunnycrest Senior Living	Y	N	Y	N	Y	Y	N	N	Y
Sunrise of Fullerton	Y	N	Y	Y	Y	Y	Y	Y	Y
Park Vista	Y	N	Y	N	Y	Y	N	Y	Y
Acacia Villas Assisted Living	Y	Y	Y	N	Y	Y	N	N	Y
Cambridge Court Assisted Living	Y	N	Y	N	Y	Y	N	N	Y
Fullerton Rosewood Assisted	Y	N	Y	N	Y	Y	Y	N	Y
Oasis Assisted Senior Living	Y	N	Y	N	Y	Y	N	N	Y
Glencrest Manor	Y	N	Y	N	Y	Y	N	N	Y
Applecrest Homes Assisted Living	Y	N	Y	N	Y	Y	Y	N	Y
Glenwood Care Assisted Living	Y	N	Y	N	Y	Y	N	N	Y
D'Best Care Board and Care	Y	Y	Y	N	Y	Y	Y	N	Y
Senior Living Community	Y	Y	Y	N	Y	Y	Y	N	Y

ASSET	DAM FAILURE	FLOOD	EXTREME WEATHER	LANDSLIDE	SUBSIDENCE	FAULT/ GROUND SHAKING	LIQUEFACTION	WILDFIRE	HUMAN-CAUSED
Cherub Home	Y	Y	Y	N	Y	Y	Y	N	Y
Fullerton Gardens	Y	N	Y	N	Y	Y	N	N	Y
Kindred Hospital Brea - Subacute	Y	Y	Y	N	Y	Y	Y	Y	Y
Gordon Lane Convalescent Hospital	Y	Y	Y	N	Y	Y	N	N	Y
Terrace View Care Center	Y	N	Y	N	Y	Y	N	N	Y
The Pavilion at Sunny Hills	Y	N	Y	Y	Y	Y	N	N	Y
Windsor Garden of Fullerton	Y	N	Y	N	Y	Y	Y	N	Y
Genesis - St. Elizabeth Healthcare and Rehabilitation Center	Y	N	Y	N	Y	Y	N	N	Y
Greenfield Care Center	Y	N	Y	N	Y	Y	N	N	Y
Park Vista at Morningside	Y	N	Y	N	Y	Y	N	Y	Y
Santa Ana Armory Cold Weather Shelter	Y	Y	Y	N	Y	Y	Y	N	Y
Women's Transitional Living Center	**Facility not mapped for security reasons**								
New Vista Immediate Response Housing	**Facility not mapped for security reasons**								

5 MITIGATION STRATEGY

WHAT'S DIFFERENT ABOUT THE 2026 PLAN?

- Five mitigation actions identified in the previous 2020 LHMP were completed; 36 mitigation projects have been initiated since the approval of the previous 2020 LHMP.
- Ten new mitigation actions have been added as part of the 2026 LHMP Update.

SECTION 5: MITIGATION STRATEGY

Hazard mitigation strategies are used to reduce hazard impacts on critical facilities or other infrastructure identified by the City and LHMP Planning Team. This section is developed from an in-depth review of the vulnerabilities and capabilities described in the previous plan section. Overall, the mitigation strategies are actions which represent the City's approach to reducing and/or eliminating potential losses as identified in Section 4.0, *Hazards Assessment*.

5.1 HAZARD MITIGATION OVERVIEW

5.1.1 FEMA'S NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) provides affordable flood insurance to property owners, renters, and businesses by encouraging communities to adopt and enforce floodplain management regulations. Participation in the NFIP is optional; however, property owners who live in a non-participating community with flood-prone areas are not able to purchase flood insurance through the program. Communities with mapped floodplains cannot receive federal grants or loans for development activities in flood-prone areas and cannot receive federal disaster assistance to repair flood damaged buildings or structures in mapped floodplains if the jurisdiction is not a participant of the NFIP.

The City is a participant of the NFIP and implements the requirements of NFIP through the Fullerton Municipal Code Chapter 14.01, Prohibitions. Specific administration and enforcement regulations are outlined in Section 14.01.015, Flood Zone Development. Section 14.01.015 states: "The areas of special flood hazard identified by Federal Emergency Management Agency (FEMA) in the Flood Insurance Study (FIS) for Orange County, California and Incorporated Areas, dated December 3, 2009, and accompanying Flood Insurance Rate Maps (FIRMs), and all subsequent amendments and/or revisions thereto, are hereby adopted by reference and declared to be a part of this chapter." The latest FIRM maps adopted for the City are dated effective December 3, 2009.

The Fullerton Municipal Code Section 14.01.015(25)(c)(1) designated the City Engineer responsible for administering and implementing the provisions of the NFIP. All development, including new construction and substantial improvements, within designated special flood hazard zones must be in full compliance with Chapter 14.01. The terms "new construction" and "substantial improvement" are defined in Section 14.01.015(25) and Section 14.01.015(24) of the Municipal Code, respectively. All new construction and substantial improvement are subject to the development standards outlined in Chapter 14.01, which implement NFIP requirements. Requirements for new construction and significant improvement would also apply after any event where the property has been impacted by flood. No other specific regulations or requirements are outlined in the City code for implementation after any event where a property had substantial improvement or damage. Significant flood events are rare within the City, even during heavy precipitation years. To date, the City contains zero Severe Repetitive Loss (SRL) and two Repetitive Loss (RL) properties within the jurisdiction. No further data about the development type at either RL property is available at this time.

5.1.2 HAZARD MITIGATION PRIORITIZATION

The LHMP Project Management Team and the LHMP Planning Team discussed each mitigation action to identify priority, using the following as guidance:

- High Priority: Top organizational priority and is a well-detailed project idea. Protects population, resource, facility, or property at considerable risk. Uses feasible methods, techniques, or technology.
- Medium Priority: A promising idea that needs more information or is an action that addresses a moderate hazard.
- Low Priority: An idea that needs more information or will take a lot of preliminary action to build support.

The hazard ranking exercise was completed as part of LHMP Planning Team Meeting #1. Additional discussion during focus group meetings and the LHMP Planning Team Meeting #2 influenced the ultimate priority and timeline of each hazard. The LHMP Planning Team considered the frequency and severity of the hazard; the vulnerability of critical facilities or infrastructure; the impacts the mitigation action would avoid or reduce; the benefits of the action on the community; the critical facilities that would benefit; the environmental benefits of the action; and the capability of the City to implement the action. For example, actions may require further study or information but were identified as a high priority because of current conditions (i.e., heightened risk of the hazard, probability of future occurrences, or lack of redundancy established in a specific portion of the community). Several actions were identified as high priority, while the nature and complexity of the action involves a "long-term" timeline of five or more years.

MITIGATION STRATEGY AT A GLANCE

As part of this update, the LHMP Planning Team focused mitigation actions to include capital improvement projects and community engagement campaigns that make the community safer and establish eligibility for FEMA hazard mitigation grant programs.

60
Total Actions

10
New Actions

10
Actions Removed

18
Hazards Addressed

5
Completed Mitigation Actions

36
Mitigation Actions In Progress

The LHMP Planning Team used the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria, as described in **Table 5-1: STAPLE/E Review and Selection Criteria** when considering and prioritizing the most appropriate mitigation alternatives for the City. This methodology, as endorsed by FEMA, requires that social, technical, administrative, political, legal, economic, and environmental considerations be considered when reviewing potential actions. This process was used to help ensure that the most equitable and feasible actions would be undertaken based on the City's unique capabilities.

TABLE 5-1: STAPLE/E REVIEW AND SELECTION CRITERIA

STAPLE/E REVIEW	SELECTION CRITERIA
Social	• Is the proposed action socially acceptable to the jurisdiction and surrounding community? • Are there equity issues involved that would mean that one segment of the jurisdiction and/or community is treated unfairly? • Will the action cause social disruption?
Technical	• Will the proposed action work? • Will it create more problems than it solves? • Does it solve a problem or only a symptom? • Is it the most useful action considering other jurisdiction goals?
Administrative	• Can the jurisdiction implement the action? • Is there someone to coordinate and lead the effort? • Is there sufficient funding, staff, and technical support available? • Are there ongoing administrative requirements that need to be met?
Political	• Is the action politically acceptable? • Is there public support both to implement and to maintain the project?
Legal	• Is the jurisdiction authorized to implement the proposed action? • Are there legal side effects? Could the activity be construed as a taking? • Will the jurisdiction be liable for action or lack of action? • Will the activity be challenged?
Economic	• What are the costs and benefits of this action? • Do the benefits exceed the costs? • Are initial, maintenance, and administrative costs considered? • Has funding been secured for the proposed action? If not, what are the potential funding sources (public, nonprofit, and private)?

STAPLE/E REVIEW	SELECTION CRITERIA
	• How will this action affect the fiscal capability of the jurisdiction? • What burden will this action place on the tax base or local economy? • What are the budget and revenue effects of this activity? • Does the action contribute to other jurisdiction goals? • What benefits will the action provide?
Environmental	• How will the action affect the environment? • Will the action need environmental regulatory approvals? • Will it meet local and state regulatory requirements? • Are endangered or threatened species likely to be affected?

5.1.3 HAZARD MITIGATION BENEFIT-COST REVIEW

FEMA requires local governments to analyze the benefits and costs of a range of mitigation actions that can reduce the effects of each hazard within their communities. Benefit-cost analysis is used in hazard 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 to avoid disaster-related damages later. The analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk.

A hazard mitigation plan must demonstrate that a process was employed which emphasized a review of benefits and costs when prioritizing the mitigation actions. The benefit-cost review must be comprehensive to the extent that it can evaluate the monetary as well as the nonmonetary benefits and costs associated with each action. The benefit-cost review should at least consider the following questions:

- How many people will benefit from the action?
- How large an area is impacted?
- How critical are the facilities that benefit from the action (e.g., which is more beneficial to protect, the fire station or the administrative building)?
- Environmentally, does it make sense to implement this project for the overall community?

More details regarding specific funding mechanisms (both internal funding and grant resources) are provided within **Table 5-3: Hazard Mitigation Actions** below.

5.1.4 STATUS OF PREVIOUS PLAN ACTIONS

The previous 2020 LHMP identified 65 mitigation actions for the City of Fullerton. The LHMP Project Management Team reviewed previous mitigation actions from the 2020 LHMP and determined that several listed mitigation actions were completed by the City; these mitigation actions are listed in **Table 5-2: Completed 2020 Mitigation Actions** with notes regarding action

implementation. Because these mitigation actions were completed, these mitigation actions are not carried over into the plan update.

Most mitigation actions identified in the 2020 LHMP were included in this plan update with revisions. Revisions ranged from including information about mitigation action progress, or providing additional context and clarity from the best available data. Additionally, about ten mitigation actions from the previous plan were re-organized to reduce redundancy. For example, the previous LHMP included multiple directives to examine generator capacity at critical facilities and procure new equipment. These mitigation actions were consolidated into one concise action to enhance plan clarity. New mitigation actions and mitigation actions carried over with revisions are appropriately labeled in the matrix below.

Mitigation actions in this LHMP update were adjusted to account for the increased risk and vulnerability associated with the current hazards experienced by the planning area. Priority actions include capital improvement projects and community engagement campaigns that make the City more resilient.

TABLE 5-2: COMPLETED 2020 LHMP MITIGATION ACTIONS

COMPLETED 2020 MITIGATION ACTION	NOTES
Mitigation Action P.2: Update the Community Forest Master Plan, incorporating drought strategies and wildfire vulnerabilities into the planning framework.	City staff completed preparation of the Community Forest Master Plan, and began implementation programs including opportunities to obtain trees to forest the City.
Mitigation Action P.3: Hire a full-time Emergency Operations Coordinator for Fullerton.	The City hired a full-time Emergency Manager, who served as the project manager for this LHMP update.
Mitigation Action P.5: Update Safety Element to incorporate the 2019 Local Hazard Mitigation Plan.	The City integrated the previous 2020 LHMP into the Safety Element Update in compliance with AB2140.
Mitigation Action 5.2: Create a hillside weed abatement pilot program using goats or other livestock to reduce fuel loads in fire-prone areas.	The City successfully launched a hillside weed abatement program using goats to clear excess vegetation. This pilot program was successful, and included continued use of grazing goats for fuel modification is included in this LHMP update.
Mitigation Action 5.3: Obtain a Type 3 Fire Engine to respond to potential fire threats in the fire-prone areas of the City.	The City procured both a Type 1 and Type 3 Fire Engine to respond to fire threats within the planning area.

5.2 HAZARD MITIGATION ACTIONS

The LHMP Planning Team worked together to identify mitigation actions and establish the responsible department, priority level, and timeline. The process used is outlined below:

- Review of the Vulnerability and Risk Assessment presented in Section 4.0, *Hazards Assessment*;

- Review of the Capabilities Assessment presented in Section 5.3, *Capabilities Assessment*;
- Review of the results of the community survey and feedback received as part of the community outreach; and,
- The LHMP Planning Team's discussion of concerns/issues that need to be addressed to reduce hazards to critical facilities and the community.

Table 5-3 Hazard Mitigation Actions identifies the mitigation action, hazard(s) addressed, agency and/or department responsible for implementation, potential funding source(s), timeline for implementation, and priority.

The timeline for implementation is defined as follows:

- Ongoing: currently in process; or 1-2 years and ongoing thereafter;
- Short-Term: 1 to 2 years;
- Medium-Term: 3 to 4 years; and
- Long-Term: 5+ years.

Mitigation actions below may be funded through the City budget, particularly mitigation actions identified as "ongoing." However, the City will also explore funding for specific mitigation actions through local, State, or federal grant programs. Potential grant programs or funding mechanisms are identified for specific mitigation actions as applicable, below.

The City maintains and annually updates a Capital Improvement Project (CIP) budget that identifies priority City projects and major equipment purchases for all City departments. Identified capital improvement projects were integrated into the LHMP mitigation actions where appropriate for projects with a nexus to resilience or natural hazards. In addition, as part of the annual review and update of the CIP budget, mitigation actions will be reviewed and integrated.

All mitigation actions considered for the City were included in the LHMP and **Table 5-3: Hazard Mitigation Actions**. There were no mitigation actions considered but excluded from the LHMP. The mitigation action development process is documented in Appendix B, *LHMP Planning Team Documentation* and was a key area of focus during all focus group meetings and Stakeholder Meeting #2. Appendix B, *LHMP Planning Team Documentation* also documents revisions, comments, and feedback, from the LHMP Planning Team, Project Management staff and the City's consultant, Michael Baker International.

TABLE 5-3: MITIGATION ACTION TABLE

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
1	Continue to support Fullerton Community Emergency Response Team (CERT) to build community capacity in personal emergency preparedness and response [new mitigation action].	All Hazards	**Internal**: Fire Department	**FEMA:** Hazard Mitigation Grant Program (HMGP), Safeguarding Tomorrow Revolving Loan Fund (RLF) **Cal FIRE:** Wildfire Prevention Grants, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **EPA:** Wildfire Smoke Preparedness in Community Buildings Grant Program **Staff Time, General Fund**	Ongoing	Medium Priority
2	Promote and assist residents and business owners in developing and regularly updating personal emergency preparedness plans. Promote the existing Alert OC system [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** Fire Department, Police Department, City Manager's Office	**FEMA:** HMGP, RLF, EMPG **Staff Time, General Fund**	Ongoing	Medium Priority
3	Organize frequent educational workshops on personal emergency preparedness topics (e.g., essential items for emergency kits, evacuation routes, landscaping to reduce runoff and fire risk) for residents and business owners [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** Fire Department	**FEMA:** HMGP **Cal FIRE:** Wildfire Prevention Grants Program, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **EPA:** Environmental Education Grants **Staff Time, General Fund**	Ongoing	Medium Priority
4	Conduct interjurisdictional training with partner first-responder	All Hazards	**Internal:** Fire Department and	**FEMA:** HMGP, RLF, EMPG	Ongoing	High Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	agencies in the area, including CAL FIRE, OCFA, Orange County Sheriff's Department, CSUF University Police, local utility providers, BSNF, WEROC police and fire departments of adjacent cities, and any other agencies that Fullerton may select in the future. Include trainings for response on both natural and human-caused hazards [mitigation action from previous plan, carried over with revisions].		Public Works Department, in coordination with all City Departments **External:** Cal Fire, OCFA, OCSD, utilities (SCE, SoCalGas), BNSF, WEROC, CSUF, neighboring cities	**Cal FIRE:** Wildfire Prevention Grants, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**		
5	Investigate the feasibility and cost for smart transportation demand management systems, to allow City staff to effectively direct evacuations [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** Public Works Department, Police Department, Fire Department **External:** OCSD Emergency Management	**FEMA:** RLF **Cal FIRE:** Evacuation Route Planning and Development Grant, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**	Long-Term	Low Priority
6	Develop an Open Data Platform to make hazard layers available to the public to aid future risk analysis as well as inform the public of hazard threats in their community [mitigation action from previous plan].	All Hazards	**Internal:** Community Development Department, Public Works Department	**LCI:** ICARP Adaptation Planning and Regional Resilience Grants **Staff Time, General Fund**	Long-Term	Low Priority
7	Support local businesses in preparing organization evacuation and emergency preparedness plans. Provide resources or support when requested [new mitigation action].	All Hazards	**Internal:** Police Department, Fire Department **External:** Local businesses	**Staff Time, General Fund**	Medium-Term	Medium Priority
			Multiple Hazards			
8	Continue to install, maintain and replace backup generators at key critical facilities (City Hall, Fire	All Hazards	**Internal:** Public Works Department, Fire	**FEMA:** HMGP **Cal OES:** Prepare CA – Match	Ongoing	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	Stations, Police Stations, water pumps, etc.) in the event of power loss during an emergency. Install portable generators in City-owned water facilities [mitigation action from previous plan, carried over with revisions].		Department, Police Department	**CA SWRCB:** Backup Generator Funding Program **EPA:** Water Infrastructure Resilience Grants **CEC:** Distributed Electricity Backup Assets Program, including funding through Proposition 4 – Climate Bond. **Staff Time, General Fund**		
9	Encourage utility and transportation providers (SoCalGas, Southern California Edison, Orange County Sanitation District, Metropolitan Water District of Orange County, BNSF Railway, Amtrak, and Orange County Water District) to harden their infrastructure in the city to reduce the risk of breach [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** City Manager's Office, City Council, Fire Department	**FEMA:** HMGP **DOT:** PROTECT Grant Program **HCD:** CDBG-MIT Resilient Infrastructure Program (MIT-RIP) **Staff Time, General Fund**	Ongoing	Medium Priority
10	Plant fire-resistant, drought-tolerant groundcover on slopes, inclines, and hillsides to reduce runoff and erosion during heavy rainfall [mitigation action from previous plan].	All Hazards	**Internal:** Public Works Department, Community Development Department	**FEMA:** HMGP **Cal FIRE:** Wildfire Prevention Grants Program, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**	Long-Term	Medium Priority
11	Inform residents in areas of elevated hazard risk of the risks and proper preparation techniques and evacuation procedures. Develop an Open Data Platform to make hazard data available to the public to aid in communicating risk to the community [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** City Manager's Office, Administrative Services, Police Department, Fire Department	**FEMA:** HMGP **Cal FIRE:** Wildfire Prevention Grants Program, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond	Ongoing	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
				EPA: Environmental Education Grants **Staff Time, General Fund**		
12	Position new critical facilities outside of elevated hazard risk areas and relocate existing critical facilities outside of hazard risk areas, as feasible. Regularly assess critical facility vulnerability and risk based on updated hazard data and mapping [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** Public Works Department, Community Development Department	**FEMA:** HMGP **HCD:** CDBG-MIT Resilient Infrastructure Program (MIT-RIP) **Staff Time, General Fund**	Ongoing	High Priority
13	Address structural or operational weaknesses in bridges, retaining walls, or other key infrastructure to reduce risk of failure during a hazard [mitigation action from previous plan, carried over with revisions].	All Hazards	**Internal:** Public Works Department, Community Development Department **External:** Caltrans	**FEMA:** HMGP **DOT:** PROTECT Grant Program **HCD:** CDBG-MIT Resilient Infrastructure Program (MIT-RIP) **EPA:** Water Infrastructure Finance and Innovation Act (WIFA) **Staff Time, General Fund**	Ongoing	High Priority
14	Investigate the feasibility of early warning systems to be activated across the City of Fullerton in the event of a disaster [mitigation action from previous plan].	All Hazards	**Internal:** Public Works Department, Police Department, Fire Department	**FEMA:** Next Generation Warning System Grant Program (NGWSGP), Safeguarding Tomorrow Revolving Loan Fund (RLF), Emergency Management Performance Grant (EMPG), Homeland Security Grant Program (HSGP) **Staff Time, General Fund**	Long-Term	Low Priority
15	Program pre-recorded alert and warning messages in multiple languages within police cruisers to assist in evacuation messaging during a disaster. Utilize standard messaging produced and deployed by OCSD for regional consistency [new mitigation action].	All Hazards	**Internal:** Police Department, Fire Department, Information Technology	**FEMA:** Next Generation Warning System Grant Program (NGWSGP), Homeland Security Grant Program (HSGP), EMPG **Staff Time, General Fund**	Medium-Term	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
16	Adopt an update to the City of Fullerton Safety Element, incorporating the LHMP Update by reference in accordance with AB2140 requirements. Adopt a new Environmental Justice Element to identify policies applicable to individuals with access and functional needs within Fullerton [new mitigation action].	All Hazards	**Internal:** Community Development Department	**Staff Time, General Fund**	Short-Term	Medium
17	Support American Red Cross programming, awareness, and training campaigns geared toward preparedness education toward both adults and children. Support the Red Cross in deploying the "Prepare with Pedro" programming for children [new mitigation action].	All Hazards	**Internal:** Fire Department **External:** American Red Cross, Fullerton School District	**FEMA:** EMPG **US DOE:** Readiness and Emergency Management for Schools (REMS) Grants **EPA:** Environmental Education Grants, Community Change Grants **Staff Time, General Fund**	Ongoing	Low Priority
18	Update the City's Evacuation Annex as part of an Emergency Operations Plan Update and implement directives to meet Cal FIRE requirements [new mitigation action].	All Hazards	**Internal:** Fire Department, Police Department	**FEMA:** EMPG, Homeland Security Grant Program (HSGP) **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Cal FIRE**: Wildfire Prevention Grants, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**	Short-Term	High Priority
Dam/Reservoir Failure						
19	Coordinate with local, state and federal agencies to collectively identify threats dam infrastructure within or upstream of the City. Support dam owners in efforts to regularly reassess dam inundation exposure and vulnerability, especially where critical facilities intersect with dam inundation zones. Support structural	Dam/Reservoir Failure	**Internal:** Fire Department, Public Works Department, Parks and Recreation Department, City Manager's Office **External:** Army Corps of	**FEMA:** National Dam Safety Program (NDSP) **EPA:** Water Infrastructure Finance and Innovation Act (WIFA), Clean Water State Revolving Fund (CWSRF) **Dept. of Water Resources:** Dam Safety and Climate Resilience funding, including	Ongoing	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	improvement projects to strengthen dam infrastructure [mitigation action from previous plan, carried over with revisions].		Engineers and Metropolitan Water District	funding through Proposition 4 – Climate Bond. **USACE:** Corps Water Infrastructure Financing Program **SWRCB:** Drinking Water State Revolving Fund (DWSRF) **Staff Time, General Fund**		
			Wildfire and Urban Fire			
20	Continue to remove highly flammable and non-native vegetation in Very High, High, and Moderate Fire Hazard Severity Zones and replant with fire-adapted specimens. Clear dead vegetation in reservoir footprints, railroad rights-of-way, parks, and open spaces, especially during and after a drought episode. Deploy a variety of fuel modification efforts, including previously successful goat grazing programs in difficult to reach terrain [mitigation action from previous plan, carried over with revisions].	Wildfire and Urban Fire	**Internal:** Public Works Department, Fire Department, City Manager's Office **External:** Cal FIRE, OCFA, BNSF	**FEMA:** HMGP, RLF **Cal FIRE:** Wildfire Prevention Grants, Forest Health Grants, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**	Ongoing	Medium-Priority
21	Create a rapid response plan from among Fullerton's and Orange County's first responders to secure and provide evacuation support for hospital (St. Jude), nursing and assisted living facilities, with focus on unique needs for wildfire evacuations. Continue working with identified liaisons for regular coordination and training [mitigation action from previous plan, carried over with revisions].	Wildfire and Urban Fire	**Internal:** Fire Department and Police Department **External:** Providence St. Jude Medical Center, assisted living facilities and nursing homes	**FEMA:** EMPG, Homeland Security Grant Program (HSGP), Hospital Preparedness Program (HPP) **Cal FIRE:** Wildfire Prevention Grants, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**	Short-Term	Medium Priority
22	Reinforce and regularly inspect fire retardant infrastructure such as sprinklers, fire hose terminals, and	Wildfire and Urban Fire	**Internal:** Fire Department,	**Cal FIRE:** Wildfire Prevention Grants, Fire Technology Grants,	Ongoing	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	fire suppression systems in City facilities [mitigation action from previous plan].		Public Works Department	including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **Staff Time, General Fund**		
23	Continue to maintain models to evaluate the water system to ensure it meets fire flow requirements throughout wildfire hazard zone areas in alignment with the City's Water Master Plan [mitigation action from previous plan, carried over with revisions].	Wildfire and Urban Fire	**Internal:** Public Works Department and Fire Department	**FEMA:** HMGP, Assistance to Firefighters Grant (AFG) **Cal FIRE:** Wildfire Prevention Grants, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **EPA:** Water Infrastructure Finance and Innovation Act (WIFA) **Staff Time, General Fund**	Medium-Term	High Priority
24	Continue fire hazard prevention awareness campaign to residents in the High and Very High Fire Hazard Severity Zones. Expand the existing home preparedness assessment program to assist more residents in understanding and addressing their wildfire risk [mitigation action from previous plan, carried over with revisions].	Wildfire and Urban Fire	**Internal:** Fire Department, Public Works Department, Community Development Department	**FEMA:** HMGP, Emergency Preparedness Performance Grant (EMPG), Fire Prevention and Safety (FP&S) Grants **Cal FIRE:** Wildfire Prevention Grants, California Wildfire Mitigation Program (CWMP), including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **US Forest Service:** Community Wildfire Defense Grant (CWDG) **US DOE:** Readiness and Emergency Management for Schools (REMS) Grants	Ongoing	High Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
				EPA: Environmental Education Grants, Community Change Grants **Staff Time, General Fund**		
25	Require all new development in Very High, High, and Moderate Fire Hazard Severity Zones to use noncombustible building materials such as masonry, brick, stucco, concrete, steel, or others as appropriate. Establish zones of defensible space around homes in Very High, High, and Moderate Fire Hazard Severity Zones [mitigation action from previous plan].	Wildfire and Urban Fire	**Internal:** Community Development Department, Fire Department	**FEMA:** HMGP, Ignition-Resistant Construction Funding, Safeguarding Tomorrow Revolving Loan Fund (RLF) **Cal FIRE:** Wildfire Prevention Grants, California Wildfire Mitigation Program (CWMP) including funding through Proposition 4 – Climate Bond, **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **US Forest Service:** Community Wildfire Defense Grant (CWDG) **Staff Time, General Fund**	Ongoing	High Priority
			Flood			
26	Draft an ecosystem restoration plan and upgrade of drainage systems in Gilman Park and other similar areas in Fullerton [mitigation action from previous plan].	Flood, Heavy Rains	**Internal:** Public Works Department	**FEMA:** HMGP **EPA:** Sewer Overflow and Stormwater Reuse Municipal Grants, Green Infrastructure Program Grants **Staff Time, General Fund**	Long-Term	Medium Priority
27	Create areas with permeable pavements and/or catchwater systems as an interim solution to flood control channel expansion. These solutions can help to absorb runoff and prevent the flood control channels from exceeding capacity during a storm. Integrate low impact design principles into future developments or redevelopment	Flood, Heavy Rains	**Internal:** Public Works Department	**EPA:** Sewer Overflow and Stormwater Reuse Municipal Grants **Staff Time, General Fund**	Ongoing	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	[mitigation action from previous plan, carried over with revisions].					
28	Update the City's Drainage Area Master Plan to study the existing storm drain system and drainage patterns within the City. Implement recommendations for construction of new or modified system components [mitigation action from previous plan, carried over with revisions].	Flood, Heavy Rains	**Internal:** Public Works Department	**FEMA:** HMGP, Safeguarding Tomorrow Revolving Loan Fund (RLF) **EPA:** Sewer Overflow and Stormwater Reuse Municipal Grants **SWRCB:** Storm Water Grant Program (SWGP) **Staff Time, General Fund**	Short-Term	High Priority
29	Keep all City and County flood control channels clear of debris and plant detritus that could affect the capacity of the channel during heavy rainfall events. Install large grilles over storm drain inlets to screen out large debris [mitigation action from previous plan, carried over with revisions].	Flood, Heavy Rains	**Internal:** Public Works Department **External:** OCPW	**FEMA:** HMGP, Safeguarding Tomorrow Revolving Loan Fund (RLF) **EPA:** Sewer Overflow and Stormwater Reuse Municipal Grants **SWRCB:** Storm Water Grant Program (SWGP) **USDA:** Emergency Watershed Protection (EWP) **Staff Time, General Fund**	Ongoing	High Priority
30	Continually update the mapped boundaries of floodplain inundation zones within the City and update the City's Floodplain Ordinance as appropriate [mitigation action from previous plan, carried over with revisions].	Flood, Heavy Rains	**Internal:** Public Works	**Staff Time, General Fund**	Ongoing	Low Priority
31	Continuously pursue FEMA elevation certification for all structures in Fullerton [mitigation action from previous plan].	Flood, Heavy Rains	**Internal:** Public Works	**FEMA:** HMGP, Flood Mitigation Assistance Program (FMA) **Staff Time, General Fund**	Ongoing	Medium Priority
32	Elevate and flood-proof public utility boxes above expected flood depth elevation in flood hazard inundation areas [mitigation action from previous plan].	Flood, Heavy Rains	**Internal:** Public Works	**FEMA:** HMGP, RLF **DWR:** Floodplain Management, Protection, and Risk Awareness (FMPRA) Grants **Staff Time, General Fund**	Long-Term	Medium Priority
33	Require new critical facilities to be built a minimum of 1 foot higher	Flood, Heavy Rains	**Internal:** Public Works	**Staff Time, General Fund**	Long-Term	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	than the anticipated 500-year flood elevation height, where feasible [mitigation action from previous plan].		Department, Community Development Department			
34	Explore the feasibility of joining FEMA's Community Rating System (CRS) program to reduce flood insurance costs for property owners in Fullerton [new mitigation action].	Flood, Heavy Rains	**Internal:** Public Works Department, Fire Department, Community Development Department	**Staff Time, General Fund**	Long-Term	Low Priority
35	Reduce localized flooding and stormwater runoff hazards in Fullerton, particularly at Euclid & Commonwealth and in the Hollydale neighborhood, by continuing to distribute sandbags during heavy rain events, upgrading drainage infrastructure, and implementing flood-resilient design strategies [new mitigation action].	Flood, Heavy Rains	**Internal:** Public Works Department	**FEMA:** HMGP, RLF **EPA:** Sewer Overflow and Stormwater Reuse Municipal Grants **SWRCB:** Storm Water Grant Program (SWGP) **DWR:** Floodplain Management, Protection, and Risk Awareness (FMPRA) Grants **Staff Time, General Fund**	Long-Term	Medium Priority
Geologic (Landslide, Subsidence)						
36	Build retaining walls, install shotcrete, and drape catch-fall nets on slopes or areas where landslides are likely to occur on public property. For private property, identify potential incentives for property owners to construct these improvements [mitigation action from previous plan].	Geologic (Landslide, Subsidence)	**Internal:** Public Works Department, Community Development Department	**FEMA:** HMGP, RLF **Staff Time, General Fund**	Long-Term	Medium Priority
37	Install water runoff catchment troughs to channelize and divert rainwater away from hillsides on public property. For private property, identify potential incentives for property owners to construct these improvements [mitigation action from previous plan].	Geologic (Landslide, Subsidence)	**Internal:** Public Works Department, Community Development Department	**FEMA:** HMGP, RLF **EPA:** Sewer Overflow and Stormwater Reuse Municipal Grants **SWRCB:** Storm Water Grant Program (SWGP) **DWR:** Integrated Regional Water Management (IRWM) Grants	Long-Term	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
				Staff Time, General Fund		
38	Conduct visual inspections of roadways that abut slopes or hills to assess potential for landslides prior to large rain events and follow up inspections after events [mitigation action from previous plan].	Geologic (Landslide, Subsidence)	**Internal:** Public Works, Community Development	**Staff Time, General Fund**	Ongoing	Medium Priority
Human-Caused Hazards (Aircraft/Transportation Incidents, Hazardous Materials Spill, Terrorism/Cybersecurity, Civil Unrest/Civil Disturbance, Vector-Borne Disease)						
39	Coordinate with surrounding jurisdictions, local health care providers, businesses, schools, the Orange County Health Care Agency, and the California Department of Public Health to inform community members about current public health trends or issues, free and low-cost healthcare options, treatments, and where to find local healthcare facilities [mitigation action from previous plan].	Vector-Borne Disease	**Internal:** City Manager's Office, Fire Department **External:** Orange County Health Care Agency, Orange County Public Health Department, California Department of Public Health and Centers for Disease Control	**FEMA:** Emergency Management Preparedness Grant (EMPG) **Cal OES:** Listos California Grant Program **Staff Time, General Fund**	Ongoing	Medium Priority
40	Cooperate with the Orange County Mosquito and Vector Control District to inform community members on best practices for mosquito-proofing homes and businesses and how to avoid mosquito bites [mitigation action from previous plan].	Vector-Borne Disease	**Internal:** City Manager's Office, Fire Department, Public Works Department **External:** Orange County Mosquito and Vector Control District	**FEMA:** EMPG **EPA:** Environmental Education Grants **Staff Time, General Fund**	Ongoing	Medium Priority
41	Work to reduce the local mosquito population and mitigate the risk of vector-borne disease in Fullerton by collaborating with the Orange County Mosquito and Vector Control District to identify and treat high-risk areas such as drainage	Vector-Borne Disease	**Internal:** City Manager's Office, Fire Department, Public Works Department **External:** Orange County Mosquito	**Staff Time, General Fund**	Ongoing	High Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	systems and stagnant water sources [new mitigation action].		and Vector Control District			
42	Continue to work with residents, business owners, and utilities to remove dead, dying, and diseased trees weakened by disease/pests [mitigation action from previous plan].	Vector-Borne Disease	**Internal:** Public Works Departments, Community Development Department	**Cal FIRE:** Wildfire Prevention Grants, including funding through Proposition 4 – Climate Bond **Cal OES:** Wildfire Mitigation Program, including funding through Proposition 4 – Climate Bond **CNRA:** Competitive grants for urban greening, including funding through Proposition 4 – Climate Bond **US Forest Service:** Community Wildfire Defense Grants **Staff Time, General Fund**	Ongoing	Medium Priority
43	Promote proper disposal of hazardous material items at regional collection centers operated by the County [mitigation action from previous plan].	Hazardous Materials Spill	**Internal:** City Manager's Office, Fire Department	**Staff Time, General Fund**	Ongoing	Medium Priority
44	Develop a parcel-level database, in coordination with Orange County, that tracks the status of hazardous materials storage and use, prioritized by potential threat to surrounding properties [mitigation action from previous plan].	Hazardous Materials Spill	**Internal:** Fire Department, Police Department **External:** OCSD Emergency Management Division	**Staff Time, General Fund**	Long-Term	Medium Priority
45	Coordinate with the Orange County Intelligence Assessment Center (OCIAC) to monitor potential incidents resulting in civil disturbance events (riots, mass shootings, etc.). Participate in regional continuing education and training offerings hosted at OCIAC [mitigation action from previous plan, carried over with revisions].	Terrorism/Cybersecurity, Civil Unrest/Civil Disturbance	**Internal:** Police Department, Fire Department, City Manager's Office **External:** OCSD, OCFA	**FEMA:** EMPG, HSGP **Staff Time, General Fund**	Ongoing	High Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
46	Disseminate information on cyber threats or potential terrorist activity to City staff and continually follow up with information on further developments in the situation [mitigation action from previous plan].	Terrorism/Cybersecurity	**Internal:** City Manager, Police Department	**Staff Time, General Fund**	Ongoing	High Priority
47	Regularly update cyber security software and educate business owners and residents on current internet-based threats [mitigation action from previous plan].	Terrorism/Cybersecurity	**Internal:** Information Technology, Administrative Services, City Manager's Office, Police Department	**FEMA:** Emergency Management Preparedness Grant (EMPG), Homeland Security Grant Program (HSGP) **CISA:** State and Local Cybersecurity Grant Program (SLCGP) **Staff Time, General Fund**	Ongoing	Medium Priority
48	Retrofit all critical facilities, City administration buildings, and other buildings the City may deem to be important in the future with counterterrorism design and building materials in alignment with Crime Prevention Through Environmental Design (CPTED) principles [mitigation action from previous plan, carried over with revisions].	Terrorism/Cybersecurity, Civil Unrest/Civil Disturbance	**Internal:** Public Works Department, Police Department	**FEMA:** Homeland Security Grant Program (HSGP) **Staff Time, General Fund**	Long-Term	Medium-Priority
Seismic Hazards (Fault Rupture, Ground Shaking, Liquefaction)						
49	Work with California Geologic Survey and the US Geologic Survey to identify and map the uncharted extents of fault lines within the City [mitigation action from previous plan].	Seismic Hazards	**Internal:** Community Development Department **External:** USGS, CGS	**Staff Time, General Fund**	Long-Term	Low Priority
50	Create an inventory of seismically vulnerable infrastructure, including soft-story buildings, unreinforced masonry buildings or non-ductile concreate buildings. After vulnerability is inventories, create a plan to bring structures into	Seismic Hazards	**Internal:** Community Development Department, Public Works Department	**Staff Time, General Fund**	Ongoing	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	compliance [mitigation action from previous plan, carried over with revisions].					
51	Incentivize individual property owners to upgrade and retrofit buildings or structures that are susceptible to damage or destruction during a seismic event. Encourage homeowners located near fault lines to seismically retrofit natural gas lines. Gas lines should be properly braced and equipped with automatic seismic safety shut-off valves at all structure entry points to prevent fires or explosions from ruptures caused by an earthquake [mitigation action from previous plan, carried over with revisions].	Seismic Hazards	**Internal:** Community Development, Public Works Department	**CEA:** Earthquake Retrofit Grants, Brace & Bolt Retrofit **Staff Time, General Fund**	Long-Term	Medium Priority
52	Conduct regular inspections at all City-designated critical facilities, particularly City Hall and emergency response locations and complete any seismic retrofitting, as necessary [mitigation action from previous plan, carried over with revisions].	Seismic Hazards	**Internal:** Public Works Department, Community Development Department	**FEMA:** Hazard Mitigation Grant Program (HMGP) **Staff Time, General Fund**	Ongoing	Medium Priority
53	Conduct a feasibility study to develop a revolving loan program for residents and businesses to assist with the cost of seismic and fire mitigation improvements, such as upgraded water lines that withstand seismic shaking impacts, indoor sprinkler systems that meet Chapter 7 A requirements, and/or structural modifications to meet current seismic requirements [mitigation action from previous plan].	Seismic Hazards	**Internal:** Public Works Department, Community Development Department	**FEMA:** Hazard Mitigation Grant Program (HMGP) **Staff Time, General Fund**	Medium	Medium Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
54	Notify local residents when seismic retrofit funding becomes available from state and federal resources, such as the California Earthquake Brace and Bolt Program [new mitigation action].	Seismic Hazards	**Internal:** Public Works Department, Community Development Department, Fire Department External: Cal OES	**CEA:** Earthquake Retrofit Grants, Brace & Bolt Retrofit **Staff Time, General Fund**	Ongoing	Medium Priority
Extreme Weather (Drought, Extreme Heat, Severe Winds/Santa Ana Winds, Heavy Rain, Power Outage/Utility Failure)						
55	Continue to expand smart water meter program to track water usage in commercial and industrial properties across the City [mitigation action from previous plan].	Drought, Extreme Heat, Heavy Rain	**Internal:** Public Works Department	**USBR:** WaterSMART Grants **Staff Time, General Fund**	Ongoing	Medium Priority
56	Identify opportunities (grant funding, design assistance, etc.) to sponsor homeowner retrofits from lawns to low-water-consuming plants [mitigation action from previous plan].	Drought, Extreme Heat	**Internal:** Public Works Department, Community Development Department **External:** MWD	**Staff Time, General Fund**	Ongoing	Medium Priority
57	Notify residents through public service announcements a couple of days in advance of a severe weather event. Focus on media methods that target vulnerable populations, such as elderly, disabled, lower-income, or persons with limited mobility to better ensure they have adequate time to prepare for a heatwave in advance [mitigation action from previous plan].	Extreme Heat, Severe Winds/Santa Ana Winds, Heavy Rain, Power Outage/Utility Failure	**Internal:** City Manager's Office, Police Department, Fire Department	**Staff Time, General Fund**	Ongoing	Medium Priority
58	Evaluate the long-term capacity of designated cooling centers and shelters in the City to provide sufficient relief from extreme heat. Assess the need to expand services as the frequency, length, and severity of future heatwaves that	Extreme Heat	**Internal:** Public Works Department, Parks and Recreation Department, Library	**LCI:** Extreme Heat and Community Resilience Grant (EHCRP) **Staff Time, General Fund**	Ongoing	High Priority

ACTION #	MITIGATION ACTION	HAZARD ADDRESSED	RESPONSIBLE PARTIES	POTENTIAL FUNDING SOURCES	TIMELINE	PRIORITY
	coincide with Public Safety Power Shutoffs (PSPS) [mitigation action from previous plan, carried over with revisions].					
59	Promote the Fullerton Community Center and Fullerton Public Library as SCE designated Community Resource Centers during a Public Safety Power Shutoff (PSPS), where SCE is available to support customers during PSPS or other public safety activations [new mitigation action].	Severe Winds/Santa Ana Winds, Power Outage/Utility Failure, Extreme Heat	**Internal:** Fire Department, City Manager's Office **External:** Southern California Edison	**Staff Time, General Fund**	Ongoing	High Priority
60	Trim trees that the City determines could blow over during a severe wind event. Move power lines underground when feasible [mitigation action from previous plan].	Severe Winds/Santa Ana Winds, Power Outage/Utility Failure	**Internal:** Public Works Department, Community Development Department	**Staff Time, General Fund**	Ongoing	High Priority

5.3 CAPABILITIES ASSESSMENT

The capabilities assessment identifies existing local agencies, personnel, planning tools, public policy and programs, technology, and funding resources that can support the hazard mitigation measures in this Plan. This assessment helps determine the current ability of Fullerton to reduce damage from hazard events, providing a foundation to develop, consider, and prioritize future hazard mitigation measures.

5.3.1 Key Resources

The City of Fullerton has resources to support the implementation of mitigation actions including:

- Planning and regulatory capabilities are based on the implementation of ordinances, policies, local laws, and State statutes, and plans and programs that relate to guiding and managing growth and development.
- Administrative and technical capabilities refer to the staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. It also refers to the ability to access and coordinate these resources effectively.
- Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.
- Education and outreach capabilities are programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Refer to **Table 5-4: City of Fullerton Capabilities Assessment** below for a summary of City capabilities.

TABLE 5-4: CITY OF FULLERTON CAPABILITIES ASSESSMENT

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
Planning and Regulatory		
General Plan	Community and Economic Development Department	The Fullerton General Plan is the long-term, comprehensive blueprint for development and changes in the community. The policies in the general plan address land uses, public safety, environmental protection, transportation, and others. The general plan serves as a framework for mitigation actions, establishing the overarching policies for mitigation activities. Mitigation actions may be directly incorporated into the general plan to provide a stronger enforcement mechanism.
Urban Water Management Plan (UWMP)	Public Works Department	The UWMP provides an assessment of the present and future water supply sources and demand within the City's

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		service area. It presents an update to the 2015 UWMP on the City's water resource needs, water use efficiency programs, water reliability assessment and strategies to mitigate water shortage conditions.
Water Shortage Contingency Plan (WSCP)	Public Works Department	The WSCP is a strategic planning document that provides a structured guide for the City to deal with water shortages. This WSCP complies with California Water Code (Water Code) Section 10632, which requires that every urban water supplier shall prepare and adopt a WSCP as part of its UWMP.
Emergency Operations Plan (EOP)	Fire Department	The City's EOP establishes a comprehensive framework of direction and guidance for emergency and disaster response operations related to natural and human-caused hazards. The EOP can be used as a tool alongside the LHMP to provide mitigation and response strategies for hazard events.
County of Orange and Orange County Fire Authority Hazard Mitigation Plan	Orange County Sheriff's Department /Orange County Fire Authority	The County of Orange and Orange County Fire Authority Hazard Mitigation Plan identifies Orange County's natural hazards and presents a variety of actions and projects, proposed or in progress, which can help mitigate the risks these hazards pose. This Plan was utilized as a reference document in the formation of this updated LHMP.
National Flood Insurance Program (NFIP)	Community and Economic Development Department	The City of Fullerton participates in the NFIP and implements floodplain management requirements through its zoning, land use, and development regulations, informed by FEMA's regulatory flood mapping products. Continued enforcement of these regulations supports flood risk reduction and maintains the City's eligibility for federally backed flood insurance.
Floodplain Management Ordinance	Community and Economic Development Department	The ordinance establishes additional standards for development activities in the floodplain, enforced by Building and Safety Division staff in coordination with the City's floodplain manager. This

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		ordinance can be amended to implement additional flood mitigation strategies from this Plan.
Building Code	Community and Economic Development Department	The building code specifies how all new construction in the City shall be built. These requirements can be amended to require new construction to be more resilient to emergency situations. Mitigation actions to construct buildings to safer standards to enhance resilience during hazard events could be considered as part of future building code updates.
Fire Code	Community and Economic Development Department	The fire code contains specific fire safety requirements for all structures. These requirements can be modified to require increased fire safety measures and support hazard mitigation actions identified in this Plan.
City Budget	Administrative Services Department	The Fullerton City Council adopts a budget every fiscal year, which identifies sources of revenue for the City and how this money will be spent. The budget can direct funding toward hazard mitigation activities, including increased staffing, planning efforts, and capital improvements.
Development Code	Community and Economic Development Department	The code contains land use regulations, including requirements for all new construction. The code can be used to implement hazard mitigation measures related to land use and development.
Water Conservation Ordinance	Community and Economic Development Department	The City's water conservation ordinance establishes the water management requirements necessary to conserve water, enable effective water supply planning, and ensure adequate water supply. These standards help mitigate the impact of drought-related emergency events. The tools and strategies of the water conservation ordinance can be used to develop this Plan's drought mitigation actions.
Administrative and Technical		
Police Services	Police Department	Staff provides police protection services and community programs and education campaigns. Police Staff are a key

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		component of implementing mitigation actions, including but not limited to, coordinating, and communicating with the public and other agencies, ensuring safe and efficient evacuations, if necessary, and providing or participating in public education and preparedness activities that support mitigation of risks.
Fire Services	Fire Department	The Fire Department is a key component of implementing mitigation actions. Staff provide fire protection and firefighting services in Fullerton. The department's responsibilities include taking preparatory steps to prevent fires or limit their destruction. Mitigation actions related to reducing the likelihood of fires or minimizing injury and damage from fires may be implemented through Fire Department staff.
Code Compliance Division Staff	Community and Economic Development Department	Staff helps to maintain a safe, orderly, and healthy environment by ensuring compliance with building codes, property maintenance standards, land use regulations, signage rules, and the City Municipal Code. Mitigation actions related to ensuring development requirements, along with plans and programs, are updated to reflect most current hazard information.
Building and Safety Division Staff	Community and Economic Development Department	Staff is responsible for regulating the construction, alteration, use and occupancy of buildings. Staff reviews all proposals for new development in Fullerton to ensure it meets all applicable laws and ordinances and complies with all hazard-related requirements. Mitigation actions related to ensuring development requirements, along with plans and programs, are updated to reflect most current hazard information.
Planning Commission	Community and Economic Development Department	The Planning Commission advises the City Council on growth, development, and beautification of the City of Fullerton, including public spaces and vacant lots. The Planning Commission prepares and recommends updates to the General Plan

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		and reviews the Capital Improvement Program for consistency with the General Plan, ensuring that development is in accordance with mitigation actions.
City Council	City Council	The Fullerton City Council consists of five elected members, including a Mayor and Mayor Pro Tem selected annually by the Council. Supported by the City Manager and staff, the Council serves as the city's primary legislative body. The Council meets on the first and third Tuesdays of each month to adopt policies, approve plans, allocate funding, and enact local laws. The Council will be responsible for adopting this Plan and overseeing the implementation of its mitigation actions.
City Manager	City Manager's Office	The City Manager allocates and manages City resources to carry out City policy and operations as directed by the City Council, including allocating and managing staff and funding to support implementation of hazard mitigation activities. The City Manager's Office is staffed by the City Manager, Deputy City Manager, Executive Assistant, Senior Administrative Analyst, and Administrative Assistant.
Finance Division Staff	Administrative Services Department	The Administrative Services Department (Finance) is responsible for providing full fiscal transparency and financial reporting in accordance with state and federal laws. While the Administrative Services Department (Finance) does not implement mitigation actions, the department plays an important role to facilitate implementation by working with the various departments to ensure mitigation actions are incorporated into the City budget and to administer grant support.
Public Works Department Staff	Public Works Department	The Public Works Department is responsible for building and maintaining Fullerton's publicly owned infrastructure and is a key lead for mitigation actions. Staff can construct and retrofit infrastructure to reduce hazard risks in

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		the community, or to be more resilient to hazard events.
Community Development Department Staff	Community and Economic Development Department	The Community and Economic Development Department is comprised of Building & Safety, Code Enforcement, Housing, Planning and Economic Development Divisions, and is responsible for administering and enforcing the City's Zoning Code, other provisions of the Municipal Code, the General Plan, and Building Codes. Mitigation actions related to the construction of new structures, retrofits, or improvements to existing structures may be implemented through future plan processing by Community Development Department staff.
Parks and Recreation Department Staff	Parks and Recreation Department	The Parks and Recreation Department maintains 53 City parks, trails, and recreation facilities within the City. Mitigation actions involving community outreach and designations of Parks and Recreation facilities as emergency shelters may be implemented by this Department.
Human Resources Division Staff	Human Resources Department	The Human Resources Department is responsible for staff recruitment and training, as well as Risk Management functions for the City. Mitigation actions that relate to staff training may be implemented through the Human Resources Department.
Administrative Services Department	Administrative Services Department	The Administrative Services Department is composed of four divisions: Administration, Fiscal Services, Budget & Purchasing, and Revenue and Utility Services. The Department manages the City's finances and provides financial support to all departments.
City Attorney	N/A	The City Attorney represents the City and handles civil cases, advising the City on legal matters and representing it in court.
Republic Services Staff	Republic Services	The City contracts with Republic Services to provide collection and disposal services for solid waste in the community. The responsibilities of Republic Services

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		include providing services for the safe disposal of some types of hazardous material. Staff can coordinate their efforts with the relevant mitigation actions outlined in this Plan.
Southern California Edison (SCE) Staff	Southern California Edison	SCE is the electrical service provider for Fullerton. SCE also owns the electrical distribution grid in the community. Mitigation actions relating to the resiliency of Fullerton's electrical grid may use the agency's data and be implemented through coordination with SCE.
Southern California Gas Company (SoCalGas) Staff	Southern California Gas Company	SoCalGas is the natural gas provider for Fullerton and also owns the natural gas infrastructure in the community. Mitigation actions that address the resiliency of natural gas infrastructure and services in Fullerton may use the agency's data and be implemented through coordination with SoCalGas.
Financial		
General Fund	N/A	Serves as the main operating fund for the City and is used to finance the most common municipal functions (e.g., police, fire, parks, and recreation, etc.).
Capital Improvement Program	N/A	Long-range plan for individual capital improvement projects and funding sources. Projects are considered unique construction projects that provide improvements or additions such as land, buildings, and infrastructure. The Capital Improvement Program budget is an important part of the City's budget. The draft FY 2025/2026 to FY 2029/2030 budget presents over 40 capital improvement projects with expenditures totaling over $32 million. These projects provide funding for needed repairs, replacements, and improvements to streets, water infrastructure, drainage and sewage systems, parks and medians, public facilities, and other improvements.
California Governor's Office	N/A	Cal OES is responsible for overseeing and coordinating emergency preparedness, response, recovery, and homeland

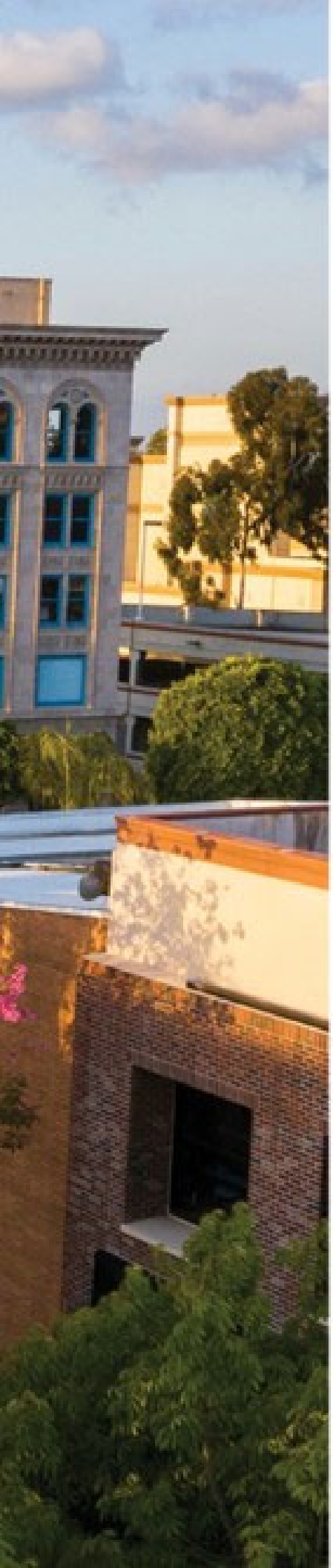
ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
of Emergency Services		security activities within California. Cal OES regularly dispatches team members to join first responders, emergency leaders and those affected by disasters that threaten public safety, to provide information essential to the public. Cal OES can assist in obtaining funding for mitigation actions identified in the plan and providing guidance on future plan updates. Additionally, Cal OES is responsible for administration and distribution of federal grant funding for the FEMA grant programs listed above.
Federal Emergency Management Agency – Hazard Mitigation Assistance Grants	N/A	FEMA is the federal agency responsible for hazard mitigation, emergency preparedness, and emergency response and recovery activities. It provides guidance to State and local governments on hazard mitigation activities, including best practices and how to comply with federal requirements. FEMA also provides funding for hazard mitigation actions through two grant programs: Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) Grant. The HMGP requires a presidential hazard declaration before funding is available; after a hazard is declared, grant applications can be submitted on a rotating basis. FMA applications typically open during the fall. Outside of the Hazard Mitigation Assistance Grants, FEMA also administers Preparedness Grants and Resilience Grants that may be applicable to future City projects.
Department of Housing and Urban Development – Community Development Block Grants	N/A	The Community Development Block Grant (CDBG) Entitlement Program provides annual grants on a formula basis to entitled cities and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons. The program is authorized under Title 1 of the Housing and Community Development

ORDINANCE/PLAN /POLICY/PROGRAM	RESPONSIBLE AGENCY OR DEPARTMENT	DESCRIPTION/COMMENTS
		Act of 1974, Public Law 93-383, as amended; 42 U.S.C. 5301 et seq. HUD awards grants to entitlement community grantees to carry out a wide range of community development activities directed toward revitalizing neighborhoods, economic development, and providing improved community facilities and services, which may be applicable to future City projects.
Education and Outreach		
American Red Cross	Coordination with Fullerton Police and Fire	Provide access to natural hazard information and resources, as well as educational and training programs. Promoting participation in American Red Cross educational and training programs would serve to mitigate hazards by increasing awareness and preparedness.
Staff Training	Coordination with Fullerton Police, Fire, and other City Departments as relevant	The City provides staff training on emergency response and preparedness. Mitigation actions may include updating or enhancing staff training on emergency response and preparedness.
City Website	Administrative Services	The website provides news and announcements to the community, including community events related to safety and emergency preparedness and mitigation. It maintains information and resources pertaining to hazards and mitigation. The City Website provides an opportunity to convey information and implement mitigation actions specific to educating and informing the community regarding all hazards and ways to reduce impacts from the hazards.

How can these capabilities be expanded upon and improved to reduce risk?
Multiple mitigation measures are priority projects to expand Fullerton's capabilities, including new plans and programs. Examples of opportunities to expand capabilities include the following mitigation actions:

Planning/Regulatory: Mitigation Actions #5, 9, 12, 25, 33, 48, 53, 58
Administrative/Technical: Mitigation Actions #1, 2, 4, 9, 18, 21, 26, 39, 41, 47
Financial: Mitigation Actions #54, 56
Education/Outreach: Mitigation Actions #3, 17, 45

6 PLAN MAINTENANCE



WHAT'S DIFFERENT ABOUT THE 2026 PLAN?

- Renewed focus on efforts to complete established mitigation actions.
- Renewed emphasis on continuous public involvement throughout the planning horizon of the LHMP.

SECTION 6: PLAN MAINTENANCE

This section identifies the formal process by which that City can ensure the LHMP remains an active and relevant document for the City of Fullerton. The LHMP maintenance process includes a schedule for monitoring and evaluating the LHMP annually and producing an update every five years to ensure the City maintains eligibility for federal and State hazard mitigation funding. This section of the LHMP also describes how the City can integrate public participation throughout LHMP maintenance and implementation process. Finally, this section describes how City staff can incorporate the mitigation actions outlined in this LHMP into existing planning mechanisms and programs and future actions and decision-making.

6.1 PURPOSE OF THE LHMP AND AUTHORITY

Under the direction of the LHMP Project Management Team (led by Kristi Hofstetter Batiste, Emergency Manager with the Fullerton Fire Department), the LHMP Planning Team will be responsible for the on-going maintenance of this LHMP. The Project Management Team will take the lead in LHMP maintenance by coordinating with the Planning Team, including undertaking the formal review process and future updates. Key City departments are identified below:

- Fire Department
- Police Department
- Public Works Department
- Community and Economic Development Department
- Parks and Recreation Department
- City Manager's Office
- City Clerk's Office
- City Council

In addition to City staff, the following partner agencies who were part of the LHMP Planning Team should be included in the maintenance and update activities:

- American Red Cross
- Amtrak

- BNSF
- Braille Institute
- CAL TRANS
- California State University, Fullerton
- City of Anaheim
- City of Brea
- City of Buena Park
- City of La Habra
- City of La Mirada
- City of Placentia
- Dale McIntosh Center
- Fullerton Airport
- Fullerton Boys and Girls Club
- Fullerton Collaborative
- Fullerton College
- Fullerton Joint Union High School District
- Fullerton School District
- HOPE Center
- Hope International University
- Marshall B. Ketchum University
- North Orange County Chamber of Commerce
- OC United
- Olive Community Services
- Orange County Emergency Management Division (within OCSD)
- Orange County Sanitation District
- Orange County Transportation Authority
- Orange County Water District
- Pathways of Hope
- Richman Center for Healthy Neighbors (CSUF)
- Rosary Academy
- Solidarity
- Southern California Edison (SoCal Edison)
- Southern California Gas Company (SoCal Gas)
- St. Jude Medical Center
- Stables V & H
- Tara's Chance
- US Army Corps of Engineers (USACE)
- WEROC
- YMCA

Although specific LHMP Planning Team and Project Management members may change, the City staff positions, departments and other partner agencies and organizations should continue to be included in the LHMP implementation and maintenance process.

The LHMP Project Management Team will facilitate the LHMP Planning Team meetings and will assign tasks such as updating and presenting the Plan to other departments, stakeholder groups, and/or elected officials. The LHMP Planning Team will be responsible for maintaining and updating the LHMP and will coordinate implementation through their respective positions and agencies. LHMP implementation and evaluation will be a shared responsibility among all LHMP Planning Team members.

6.1.1 Evaluation

At a minimum, the ongoing annual LHMP Planning Team meeting will evaluate the progress of the LHMP and incorporate the actions into other planning documents. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impacts on the community.
- Review of successful mitigation initiatives identified in the Plan.

- Brief discussion about why targeted mitigation strategies were not completed.
- Reevaluation of the mitigation actions to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project due to funding availability).
- Recommendations for new mitigation actions.
- Changes in, or potential for, new funding options/grant opportunities.
- Integration of new GIS data and maps that can be used to inform the Plan.
- Evaluation of any other planning programs or initiatives within the City that involve hazard mitigation.

The purpose of the annual evaluation will be to ensure consideration and implementation of the LHMP and document progress to inform the future LHMP update.

6.2 METHOD AND SCHEDULE FOR UPDATING THE PLAN WITHIN FIVE YEARS

Title 44 of the Code of Federal Regulations, Section 201.6(d)(3), requires that local hazard mitigation plans be reviewed, revised, and resubmitted to FEMA for approval to remain eligible for the benefits awarded under the DMA.

Monitoring the progress of the mitigation actions will be on-going throughout the five-year period between the adoption of the LHMP and the next update effort. The LHMP Planning Team will meet on an annual basis to monitor the status mitigation action implementation and develop updates, as necessary.

The City intends to update the Plan on a five-year cycle from the date of its adoption. It is anticipated that this update process will occur one year prior to expiration of the existing LHMP. This cycle may be accelerated to less than five years based on the following triggers:

- A state or presidential disaster declaration that impacts the City.
- A hazard event that causes loss of life.

Should a significant disaster occur within the City, the LHMP Planning Team will reconvene to review and update the LHMP, as appropriate. The City Council will adopt written updates to the LHMP.

6.2.1 Process

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

1. The update process will be convened through the LHMP Planning Team and will include representatives from the Fire Department and other participating departments to ensure consistency with other relevant City planning documents.
2. The hazard risk assessment will be reviewed and updated using best available information and technologies on an annual basis.

3. The evaluation of critical structures and mapping will be updated and improved as funding becomes available.
4. The mitigation actions will be reviewed and revised to account for any actions completed, deferred, or changed to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the City's General Plan).
5. The draft update will be sent to appropriate agencies for comment.
6. The public will be given an opportunity to comment prior to adoption.
7. The Fullerton City Council will adopt the updated LHMP.

The LHMP Planning Team will coordinate with responsible City departments and agencies/organizations identified for each mitigation action. These responsible departments and agencies/organizations will monitor and evaluate the progress made on the implementation of mitigation actions and report to the LHMP Planning Team on an annual basis. Working with the LHMP Planning Team, these responsible departments and agencies/organizations will be asked to assess the effectiveness of the mitigation actions and modify the mitigation actions as appropriate. The LHMP Mitigation Action Progress Report worksheet will assist mitigation leads in reporting on the status and assessing the effectiveness of the mitigation actions.

Information gathered from the City departments and external partners will be used to monitor mitigation actions and annual evaluation of the LHMP. The following questions will be considered as criteria for evaluating the Plan's effectiveness:

- Has the nature or magnitude of hazards affecting the City changed?
- Are there new hazards that have the potential to impact the City?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?
- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the LHMP?
- Should additional local resources be committed to address identified hazards?

An Annual LHMP Review Questionnaire worksheet will be used to provide guidance to the LHMP Planning Team on what should be included in the evaluation. Future updates to the LHMP will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. Issues that arise during monitoring and evaluating the LHMP, which require changes to the risk assessment, mitigation strategy and other components of the Plan, will be incorporated into the next update of the LHMP in 2031. The questions identified above will remain valid when preparing the 2031 Plan update.

6.3 LOCAL ADOPTION

Cal OES and FEMA are responsible for initial review and approval of the LHMP. After the plan check review process concludes, the Fullerton City Council is responsible for adopting the LHMP. This formal adoption should take place every five years. Once the LHMP has been finalized, the City Project Management Team will be responsible for final submission to the

California Office of Emergency Services (Cal OES). Cal OES will then submit the Plan to FEMA for final review and approval.

6.4 IMPLEMENTATION THROUGH EXISTING PROGRAMS AND PLANNING MECHANISMS

LHMP effectiveness depends on the implementation of the mitigation actions, and incorporating these actions into other City plans, policies, and programs. These mitigation actions provide the framework for activities that the City can implement over the next five years. The City has prioritized the actions in this LHMP, which will be implemented through existing plans, policies, and programs as resources become available.

The City of Fullerton Fire Department has taken on the responsibility for overseeing the Plan's implementation and maintenance through the City's existing programs. The City' Emergency Manager, or designated appointee, will assume lead responsibility for facilitating LHMP implementation and maintenance meetings. Although the City of Fullerton Fire Department will have primary responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all departments identified as lead departments in the mitigation action plan.

The LHMP can also build upon related planning efforts and mitigation programs that are already occurring within the City. This will also facilitate applying for funding opportunities as they become available. Progress on implementing mitigation actions through other City planning programs and mechanisms should be monitored and integrated into future updates.

By adopting a resolution to approve this LHMP, the City agrees to reference and incorporate the document into planning documents, programs, decisions, processes, and regulations. The LHMP will be reviewed and considered by internal City departments, as applicable plans or programs are created or updated in the future. Upon creating or updating new plans, programs or policies, City staff will review this LHMP and consider the following:

- What hazard and/or vulnerability information should be considered and/or integrated into this plan?
- Are there opportunities for this plan to support and/or implement mitigation actions?
- What mitigation actions can and should be integrated into this plan?
- Are there other community mechanisms that mitigation can be integrated?
- Is there information from this plan that can be integrated into the next LHMP update?

Opportunities for the City to integrate information from this LHMP into planning mechanisms are described below.

Planning and zoning law require California cities to adopt a comprehensive, long-term general plan for the physical development of the City. General plans are required to address natural hazards that could impact the jurisdiction and prepare for the impact of natural hazards. The Fullerton Plan serves as the City's General Plan and identifies land use patterns, future development, and growth within the planning area. The LHMP update process has allowed the City to review the policies contained in the Safety Element and identified mitigation actions that will further implement these policies. The City views the Fullerton Plan and LHMP as complimentary planning documents that work together to achieve the goal of the reduction

of risk exposure to the citizens of the City. Once the LHMP is adopted by FEMA, the City will incorporate the LHMP and vulnerability assessment by reference into existing documents to comply with California Assembly Bill 2140. The City will continue to implement NFIP standards through zoning and land use controls to reduce flood risk and minimize damage to structures and infrastructure.

The City's Capital Improvement Program (CIP) identifies capital projects and major equipment purchases for all City departments. The CIP links both the annual general plan and annual budget. Identified CIP projects were integrated into the LHMP mitigation actions where appropriate, for projects with a nexus to resilience or natural hazards. In addition, as part of the annual review and update of the CIP, mitigation actions identified will be reviewed and integrated. The City anticipates utilizing this LHMP to apply for Hazard Mitigation Assistance (HMA) grant funding such as the Hazard Mitigation Grant Program and the Flood Mitigation Assistance Grant Program for key capital improvement and infrastructure projects.

Other opportunities for integration of this LHMP include education programs and continued coordination between the City and the identified external partners. Expansion of community capacity and education programs is discussed in Section 5.3 in the previous section.

6.5 2020 LHMP PAST INTEGRATION EFFORTS

The City successfully integrated the previous 2020 LHMP into other City plans and processes to reduce risk and vulnerability within the jurisdiction. Examples of successful integration are outlined below:

2024 Safety Element Update: During the 2021 – 2029 Housing Element Update process, the City prepared a comprehensive update to the Safety Element. The 2020 LHMP served as a primary data resource for vulnerability findings. In addition, the LHMP was incorporated by reference. The Safety Element was approved by Cal FIRE/Board of Forestry in 2024, before local adoption by the City Council.

2020 Urban Water Management Plan: The 2020 LHMP was incorporated by reference into the 2020 Urban Water Management Plan. Findings related to drought and water supply resiliency are integrated, and both plans reference relevant capital improvement projects that would reduce risk.

In addition, the City was successful in implementing several mitigation actions from the 2020 LHMP, as outlined in Section 5. Overall, the City strives to maintain a culture of preparedness and ongoing hazard mitigation. Thus, this LHMP update documents several years of work toward resilience in alignment with hazard mitigation planning principles. The City anticipates integrating this LHMP into the studies and planning mechanisms listed above and applying for FEMA grant funding to implement key mitigation actions.

6.6 CONTINUED PUBLIC INVOLVEMENT

The City is dedicated to involving the public in LHMP review and updates throughout the five-year planning period. The public, including socially vulnerable populations, will continue to be informed of the LHMP actions through regular updates to the City's website. The City will

continue provide in-person educational events and activities to further inform the community regarding natural hazard risk and mitigation. Where feasible, these educational opportunities will be co-located with other safety related community events such as National Night Out.

Additionally, continued public involvement will be achieved through the promotion of hazard mitigation/emergency preparedness, trainings, interagency-coordinated outreach efforts and other hazard awareness campaigns. These are included in Section 5.0 as Mitigation Actions, particularly those listed as "Emergency Preparedness". The listed mitigation actions include outreach and communication mechanisms designed with the "whole community" approach, ensuring that socially vulnerable populations will receive messaging. The City will also inform LHMP Planning Team participants of relevant updates at the annual LHMP evaluation meeting.

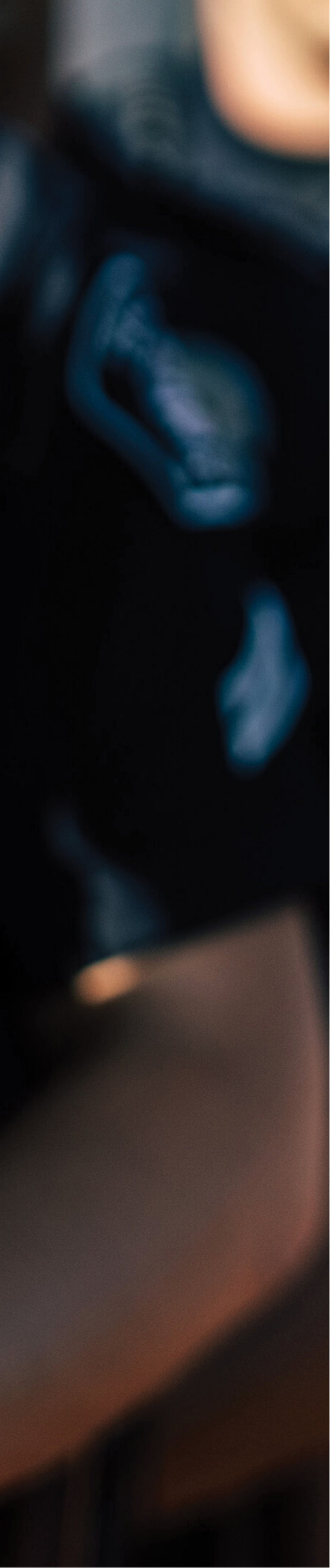
The adopted LHMP will remain permanently available for review on the City's website, with contact information for interested parties to direct comments and concerns. All public feedback will be reviewed and considered for incorporation (if deemed appropriate) into the next LHMP update.

Upon initiation of the LHMP update process, a new public involvement strategy will be developed based on guidance from the LHMP Planning Team. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of the City website, email distribution lists and local media outlets within the planning area. At this time, a re-evaluation of local socially vulnerable populations will be conducted for improved understanding of how to reach and engage these groups.

6.7 POINT OF CONTACT

Kristi Hofstetter Batiste, Emergency Manager
City of Fullerton
312 E Commonwealth Avenue
Fullerton, CA 92832
Kristi.Hofstetterbatiste@fullertonfire.org

7 REFERENCES



SECTION 7: REFERENCES

The following references were utilized during the preparation of this Local Hazard Mitigation Plan.

ABC News, *2 dead, 19 hurt after small plane crashes into furniture warehouse in Southern California*, https://abcnews.go.com/US/18-hurt-after-small-plane-crashes-building-southern/story?id=117284216, accessed September 17, 2025.

ABC, *2 killed, 19 injured after small plane crashes through roof of Fullerton building*, https://abc7.com/post/small-plane-crashes-fullerton-resulting-4-alarm-fire-police-say/15742833/, accessed September 22, 2025.

American Geophysical Union, *Urban areas more likely to have precipitation-triggered landslides, exposing growing populations to slide hazards*, https://news.agu.org/press-release/urban-areas-more-likely-to-have-precipitation-triggered-landslides/, accessed September 12, 2025.

Association of State Dam Safety Officials, *Baldwin Hills Dam (California, 1963)*, https://damfailures.org/case-study/baldwin-hills-dam-california-1963, accessed September 3, 2025.

Association of State Dam Safety Officials, *Dam Failures and Incidents*, https://damsafety.org/dam-failures, accessed September 3, 2025.

Bowers Museum, *Swept Under: Historic Flooding in Orange County*, https://www.bowers.org/collections-blog/swept-under-historic-flooding-in-orange-county, accessed September 5, 2025.

Britannica, *Santa Ana winds*, https://www.britannica.com/science/Santa-Ana-winds, accessed September 12, 2025.

CAL FIRE, *Airport Fire*, https://www.fire.ca.gov/incidents/2024/9/9/airport-fire, accessed September 23, 2025.

CAL FIRE, *Blue Ridge Fire*, https://www.fire.ca.gov/incidents/2020/10/26/blue-ridge-fire, accessed September 23, 2025.

7

REFERENCES

CAL FIRE, *Bond Fire*, https://www.fire.ca.gov/incidents/2020/12/2/bond-fire/, accessed September 23, 2025.

CAL FIRE, *Canyon Fire 2*, https://www.fire.ca.gov/incidents/2017/10/9/canyon-2-fire, accessed September 23, 2025.

CAL FIRE, *Freeway Complex*, https://www.fire.ca.gov/incidents/2008/11/15/freeway-complex/, accessed September 23, 2025.

CAL FIRE, *Silverado Fire*, https://www.fire.ca.gov/incidents/2020/10/26/silverado-fire, accessed September 23, 2025.

Cal-Adapt, *Extreme Heat Days and Warm Nights*, https://cal-adapt.org/tools/extreme-heat/, accessed September 12, 2025.

Cal-Adapt, *Extreme Heat Days*, https://cal-adapt.org/dashboard/data-explorer?metric=extreme-heat, accessed September 19, 2025.

California Climate Adaptation Strategy 2024, *Summary of Projected Climate Change Impacts on California*, https://climateresilience.ca.gov/overview/impacts.html, accessed September 11, 2025.

California Department of Conservation, *2023 California Landslide Response*, https://www.conservation.ca.gov/cgs/landslides/2023, accessed September 9, 2025.

California Department of Conservation, *Alquist-Priolo Earthquake Fault Zones*, https://www.conservation.ca.gov/cgs/alquist-priolo, accessed September 9, 2025.

California Department of Forestry and Fire Protection, *Incident Database*, https://www.fire.ca.gov/incidents/, accessed September 23, 2025.

California Department of Water Resources, *California's Most Significant Droughts: Comparing Historical and Recent Conditions*, February 2015.

California Department of Water Resources, Division of Safety of Dams, *Dams within the Jurisdiction of the State of California*, https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/Dams-Within-Jurisdiction-of-the-State-of-California-Listed-Alphabetically-by-Name-September-2022.pdf, published September 2022, accessed September 3, 2025.

California Department of Water Resources, *Division of Safety of Dams*, https://water.ca.gov/Programs/All-Programs/Division-of-Safety-of-Dams, accessed September 3, 2025.

California Governor's Office of Emergency Services, *2023 California State Hazard Mitigation Plan*, https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/2023-California-SHMP_Volume-1-Exec-Summary_11.10.2023.pdf, accessed September 9, 2025.

California Governor's Office, *Proclamation of a State of Emergency: February Winter Storms*, https://www.gov.ca.gov/wp-content/uploads/2024/02/2024-2-4.Feb-Winter-Storms-SOE-Proc.pdf, accessed September 18, 2025.

California Public Utilities Commission, *Public Safety Power Shutoffs (PSPS),* https://www.cpuc.ca.gov/PSPS/, accessed September 11, 2025.

CBS News, *Plane crash kills 5, sparks house fire, scatters debris in neighborhood outside L.A.,* https://www.cbsnews.com/news/yorba-linda-plane-crash-today-2019-02-03-live-updates/, accessed September 17, 2025.

CDC and Prevention – National Center for Environmental Health, *Planning for an Emergency: Strategies for Identifying and Engaging At-Risk Groups*, published 2015.

CDC, *CDC H1N1 Flu: Origin of 2009 H1N1 Flu (Swine Flu),* https://archive.cdc.gov/#/details?url=https://www.cdc.gov/h1n1flu/information_h1n1_virus_qa.htm, 2009, accessed September 17, 2025.

CDC, *Homelessness and Hepatitis A—San Diego County*, 2016–2018, https://stacks.cdc.gov/view/cdc/153467, accessed September 23, 2025.

CDC, *Influenza Pandemics of the 20th Century*, https://stacks.cdc.gov/view/cdc/16102, accessed September 17, 2025.

CDC, *Lesson 1: Introduction to Epidemiology*, Section 11, https://archive.cdc.gov/#/details?url=https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html, accessed September 10, 2025.

CDC, *Measles Outbreak — California, December 2014–February 2015*, https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6406a5.htm, accessed September 23, 2025.

CDC, *Vector-Borne Diseases*, https://www.cdc.gov/climate-health/php/effects/vectors.html, accessed September 11, 2025.

Center of Disease Control/Agency for Toxic Substances and Disease Registry, *CDC/ATSDR Social Vulnerability Index (SVI),* https://www.atsdr.cdc.gov/place-health/php/svi/svi-interactive-map.html, accessed August 27, 2025.

City of Fullerton, *2020 Urban Water Management Plan*, June, 2021.

City of Fullerton, *Current Development Projects*, https://www.cityoffullerton.com/government/departments/community-and-economic-development/planning-zoning/development-activity, accessed August 28, 2025.

Climate Central, *Derailments May Increase as 'Sun Kinks' Buckle Tracks*, https://www.climatecentral.org/news/climate-change-warp-railroad-tracks-sun-kinks-17470, accessed September 11, 2025.

7

REFERENCES

Climate Central, *Weather-related Power Outages Rising*, https://www.climatecentral.org/climate-matters/weather-related-power-outages-rising, published April 24, 2024, accessed September 11, 2025.

Climate Diplomacy Organization, *Insurgency, Terrorism and Organized Crime in a Warming Climate*, https://www.climate-diplomacy.org/publications/insurgency-terrorism-and-organised-crime-warming-climate, accessed September 11, 2025.

Columbia University, *Can studying climate change help predict civil unr*est, https://giving.columbia.edu/can-studying-climate-change-help-predict-civil-unrest, accessed September 11, 2025.

County of Orange and Orange County Operational Area, *Excessive Temperature Annex*, May 2021.

County of Orange, *Unified County of Orange and Orange County Operational Area Emergency Operations Plan*, February 2019.

Daily Titan, *Pro-immigration protesters block downtown Fullerton*, https://dailytitan.com/news/pro-immigration-protesters-block-downtown-fullerton/article_7329de14-e779-11ef-ab88-67fb443a7b40.html, accessed September 17, 2025.

Department of Homeland Security, *Hazardous Materials Incidents*, https://www.ready.gov/hazardous-materials-incidents, accessed September 10, 2025.

Edwards, F.L., Goodrich, D.C. *Climate Change-Related Threats to Railroads: Implications for Threat, Hazard and Risk Assessment*, September 4, 2025.

Federal Bureau of Investigation, *OPS Active Shooter Guide*, https://www.fbi.gov/file-repository/active-shooter-508.pdf/view, accessed September 10, 2025.

Federal Bureau of Investigation, *Terrorism*, https://www.fbi.gov/investigate/terrorism, accessed September 10, 2025.

Federal Transit Administration, *Recommended Emergency Preparedness Guidelines for Rail Transit Systems*, https://www.transit.dot.gov/regulations-and-guidance/safety/recommended-emergency-preparedness-guidelines-rail-transit-systems, accessed September 10, 2025.

Federal Transit Administration, *Safety Risk Mitigations and Corrective Actions*, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/regulations-and-guidance/safety/public-transportation-agency-safety-program/134101/safety-risk-mitigations-and-corrective-actions-guide.pdf, accessed September 10, 2025.

FEMA, *FEMA Flood Maps and Zones Explained*, https://www.fema.gov/blog/fema-flood-maps-and-zones-explained, accessed September 5, 2025.

FEMA, *Flood Risk Increases After Fires Are Out – Buy Flood Insurance Now*, https://www.fema.gov/fact-sheet/4562/flood-risk-increases-after-fires-are-out-buy-flood-insurance-now, published October 21, 2020, accessed September 4, 2025.

FEMA, *Glossary: Flood*, https://www.fema.gov/about/glossary/b, accessed September 4, 2025.

FOX 11 Los Angeles, *'Life-threatening' windstorm brings critical fire weather back to Southern California*, https://www.foxla.com/news/southern-california-windstorm-january-7-2025, accessed September 18, 2025.

GoodRX Health, *The Novel Coronavirus: What are Novel Viruses, and How do they Impact Public Health?,* https://www.goodrx.com/conditions/covid-19/what-does-novel-coronavirus-mean-science-medical-definition, updated February 21, 2023, accessed September 10, 2025.

Guzman-Morales, J., & Gershunov, A., Scripps Institution of Oceanography, University of California, San Diego, *Climate change suppresses Santa Ana winds of Southern California and sharpens their seasonality*, 2019.

Health and Safety Code Division 20, Chapter 6.95, *Hazardous Materials Release Response Plans and Inventory*, Article 1.

John, T. Abatzoglou, and A. Park William, *Impact of Anthropogenic Climate Change on Wildfire Across western US Forest*s, Proceedings of the National Academy of Sciences, October 10, 2016. https://www.pnas.org/doi/10.1073/pnas.1607171113, accessed September 11, 2025.

KTLA5, *Fire in Fullerton causes school lockdown*, https://ktla.com/video/fire-in-fullerton-causes-school-lockdown/9351338/, accessed September 22, 2025.

KTLA5, *Man in critical condition, dogs injured after Fullerton house fire*, https://ktla.com/news/local-news/man-in-critical-condition-dogs-injured-after-fullerton-house-fire/, accessed September 22, 2025.

Living New Deal, *Brea Creek Flood Control Project – Fullerton CA*, https://livingnewdeal.org/sites/brea-creek-flood-control-project-fullerton-ca/, accessed September 5, 2025.

Los Angeles Daily News, *Tens of thousands in Southern California could lose power starting Monday with return of high winds*, https://www.dailynews.com/2025/01/18/thousands-in-southern-california-still-without-power-because-of-high-wind-damage/, accessed September 19, 2025.

Los Angeles Times, *2,000 Near Dam Are Evacuated*, https://www.latimes.com/archives/la-xpm-2005-jan-15-me-prado15-story.html, accessed September 3, 2025.

Los Angeles Times, *3 Yorba Linda homes more than shaken by quake*, https://www.latimes.com/local/la-me-yorbaquake31-2008jul31-story.html, accessed September 22, 2025.

Los Angeles Times, *Bond fire rapidly jumps through Orange County canyons, forcing evacuations*, https://www.latimes.com/california/story/2020-12-03/wind-driven-bond-fire-threatens-homes-in-orange-county-as-santa-anas-hit-southern-california, accessed September 23, 2025.

Los Angeles Times, *Magnitude 4.8 Quake Rattles the Southland*, https://www.latimes.com/archives/la-xpm-2002-sep-04-me-quake4-story.html, accessed September 22, 2025.

Los Angeles Times, *Orange County under siege by wildfires; 2 firefighters gravely burned*, https://www.latimes.com/california/story/2020-10-26/silverado-fire-ignites-in-orange-county, accessed September 23, 2025.

Los Angeles Times, *The Earthquake in Orange County: Warning: Soil Could Turn to Mush in a Strong Earthquake*, https://www.latimes.com/archives/la-xpm-1987-10-03-me-2848-story.html, published October 3, 1987, accessed September 19, 2025.

Mayo Clinic, *Heat Exhaustion*, https://www.mayoclinic.org/diseases-conditions/heat-exhaustion/symptoms-causes/syc-20373250, accessed September 12, 2025.

National Drought Mitigation Center, *Drought Basics*, https://drought.unl.edu/Education/DroughtBasics.aspx, accessed September 5, 2025.

National Geographic Society, *Landslide*, https://education.nationalgeographic.org/resource/landslide/, accessed September 9, 2025.

National Institute of Standards and Technology, *NIST Special Publication 1800-10, Protecting Information and System Integrity in Industrial Control System Environments: Cybersecurity for the Manufacturing Sector*, https://csrc.nist.gov/pubs/sp/1800/10/final, accessed September 10, 2025.

National Oceanic and Atmospheric Administration, *Wildfire Climate Connection*, https://www.noaa.gov/noaa-wildfire/wildfire-climate-connection, accessed September 11, 2025.

National Weather Service Climate Prediction Center, *U.S. Seasonal Drought Outlook*, https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php, accessed September 12, 2025.

National Weather Service, *Beaufort Wind Scale*, https://www.weather.gov/mfl/beaufort, accessed September 12, 2025.

National Weather Service, *What is the Heat Index?,* https://www.weather.gov/ama/heatindex#:~:text=The%20heat%20index%2C%20also%20known,sweat%20to%20cool%20itself%20off., accessed September 12, 2025.

New York Times, *The Coming California Megastorm*, https://www.nytimes.com/interactive/2022/08/12/climate/california-rain-storm.html, published August 12, 2022, accessed September 5, 2025.

NOAA National Weather Service, *A History of Significant Weather Events in Southern California*, https://www.weather.gov/media/sgx/documents/weatherhistory.pdf, updated March, 2025, accessed September 5, 2025.

NOAA, *Definition of Drought*, https://www.ncdc.noaa.gov/monitoring-references/dyk/drought-definition, accessed September 5, 2025.

NOAA, NWS, *Heavy Precipitation Events California and Nevada Section 2: Late February and March 2023*, https://www.cnrfc.noaa.gov/storm_summaries/febMar2023storms.php, accessed September 17, 2025.

NOAA, *Storm Events Database*, https://www.ncei.noaa.gov/stormevents/eventdetails.jsp?id=1218698, accessed September 12, 2025.

NOAA, *What are El Niño and La Niña?*, https://oceanservice.noaa.gov/facts/ninonina.html, accessed September 12, 2025.

NWS, *Mountain and Valley Winds*, https://www.weather.gov/safety/wind-mountain-valley, accessed September 9, 2025.

OC Healthcare Agency, *Orange County Covid-19 Dashboard*, https://www.ochealthinfo.com/services-programs/disease-prevention/diseases-conditions/covid-19-resources, accessed September 17, 2025.

Office of Governor Gavin Newsom, *Governor Newsom Expands Drought Emergency Statewide, Urges Californians to Redouble Water Conservation Efforts*, https://www.gov.ca.gov/2021/10/19/governor-newsom-expands-drought-emergency-statewide-urges-californians-to-redouble-water-conservation-efforts/, accessed September 12, 2025.

Office of Governor Gavin Newsome, *Governor Newsome Expands Drought Emergency to Klamath River, Sacramento-San Joaquin Delta, and Tulare Lake Watershed Counties*, https://www.gov.ca.gov/2021/05/10/governor-newsom-expands-drought-emergency-to-klamath-river-sacramento-san-joaquin-delta-and-tulare-lake-watershed-counties/, published May 10, 2021, accessed September 12, 2025.

Orange County Health Care Agency, *Response to Pandemic H1N1 2009 Influenza*, https://www.ochealthinfo.com/sites/hca/files/import/data/files/13257.pdf, accessed September 23, 2025.

Orange County Health Care Agency, *West Nile Virus, Orange County 2011 – 2018*, https://ochealthinfo.com/sites/hca/files/import/data/files/102025.pdf, accessed September 23, 2025.

Orange County Public Works, *Orange County GIS Open Data Portal: Our Watersheds*, https://data-ocpw.opendata.arcgis.com/maps/OCPW::orange-county-our-watersheds/explore?location=33.766961%2C-117.759619%2C11.14, accessed September 5, 2025.

Patch News, *Orange County Rain Totals From Tropical Storm Hilary: Cleanup Ensues*, https://patch.com/california/orange-county/orange-county-rain-totals-tropical-storm-hilary-cleanup-ensues, accessed September 17, 2025.

Rancho Santiago Community College District, *RSCCD Natural Hazard Mitigation Plan*, 2016.

San Bernardino Sun, *SCE warns of potential power shutoffs to prevent wildfires*, https://www.sbsun.com/2025/07/04/sce-warns-of-potential-power-shutoffs-to-prevent-wildfires/, accessed September 19, 2025.

Southern California Association of Governments, *SCAG 6th Cycle Final RHNA Allocation Plan*, https://scag.ca.gov/sites/default/files/2024-05/6th_cycle_final_rhna_allocation_plan_070121.pdf, accessed August 25, 2025.

Southern California Earthquake Center, *Significant Earthquakes and Faults*, http://scedc.caltech.edu/significant/fault-index.html, accessed September 19, 2025.

Southern California Earthquake Data Center, *Earthquake Information*, https://scedc.caltech.edu/earthquake/faults.html, accessed September 16, 2025.

Southern California Earthquake Data Center, *Elsinore Fault Zone*, https://scedc.caltech.edu/earthquake/elsinore.html, accessed September 16, 2025.

Southern California Earthquake Data Center, *Newport-Inglewood Fault Zone*, https://scedc.caltech.edu/earthquake/newport.html, accessed September 16, 2025.

Southern California Edison Transmission and Distribution, *Transmission Inspection and Maintenance Program (TIMP),* June 24, 2022.

Southern California Edison, *Public Safety Power Shutoff*, https://www.sce.com/wildfire/psps, accessed September 9, 2025.

Stanford News, *California drought patterns becoming more common, Stanford scientists say*, https://news.stanford.edu/2016/04/01/drought-patterns-change-040116/, published April 1, 2016, accessed September 12, 2025.

State of California OEHHA, *CalEnviroScreen 4.0 Excel and Data Dictionary*, https://oehha.ca.gov/calenviroscreen/maps-data, access August 27, 2025.

State of California OEHHA, *CalEnviroScreen 4.0 Maps & Data*, https://oehha.ca.gov/calenviroscreen/maps-data, access August 27, 2025.

State Water Resources Control Board, *GeoTracker*, https://geotracker.waterboards.ca.gov/, accessed September 17, 2025.

The Fullerton Plan, *Part II: The Fullerton Plan Elements, E: Tables and Exhibits*.

The Orange County Register, *More than 2,300 lose power after pickup truck hits power pole in La Habra*, https://www.ocregister.com/2025/09/14/more-than-2300-lose-power-after-pickup-truck-hits-power-pole-in-la-habra/, accessed September 19, 2025.

The Orange County Register, *Orange County declares local emergency amid winter storms, governor adds OC to state declaration*, https://www.ocregister.com/2023/03/14/orange-county-declares-local-emergency-amid-winter-storms/, accessed September 17, 2025.

The Orange County Register, *Powerful storm dumps rain, snow on Southern California*, https://www.ocregister.com/2021/12/14/powerful-storm-begins-dumping-rain-snow-on-southern-california/, updated December 15, 2021, accessed September 17, 2025.

U.S. Climate Data, *Climate Fullerton - California*, https://www.usclimatedata.com/climate/fullerton/california/united-states/usca1767, accessed September 12, 2025.

U.S. Department of the Interior and U.S. Geological Survey, *The Third California Earthquake Rupture Forecast (UCERF3)*, March 2015.

U.S. Drought Monitor, *California*, https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA, accessed September 11, 2025.

U.S. Drought Monitor, *Drought Classification*, https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx, accessed September 9, 2025.

U.S. Drought Monitor, *Time Series*, https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx, accessed September 12, 2025.

U.S. EPA, *Climate Change Indicators: Heavy Precipitation*, https://www.epa.gov/climate-indicators/climate-change-indicators-heavy-precipitation, accessed September 9, 2025.

U.S. EPA, *Health and Ecological Hazards Caused by Hazardous Substances*, https://www.epa.gov/emergency-response/health-and-ecological-hazards-caused-hazardous-substances, accessed September 10, 2025.

U.S. Federal Code Title 18, Chapter 113B, Section 2331.

UCLA Newsroom, *Study forecasts a severe climate future for California*, https://newsroom.ucla.edu/releases/california-extreme-climate-future-ucla-study, accessed September 5, 2025.

US Army Corps of Engineers, *Flood Emergency Action Plan: Prado Dam*, December 2021.

US Army Corps of Engineers, *National Inventory of Dams*, https://nid.sec.usace.army.mil/#/, accessed September 3, 2025.

US Census Bureau, 2023: American Community Survey 5-Year Estimates*, DP03 Selected Economic Characteristics*.

US Census Bureau, 2023: American Community Survey 5-Year Estimates, *DP04 Selected Housing Characteristics*.

US Census Bureau, 2023: American Community Survey 5-Year Estimates*, DP05 Demographic and Housing Estimates*.

US Census Bureau, 2023: American Community Survey 5-Year Estimates, *S1101 Households and Families*.

US Census Bureau, 2023: American Community Survey 5-Year Estimates, *S1501 Educational Attainment*.

US Census Bureau, 2023: American Community Survey 5-Year Estimates, *S2503 Financial Characteristics*.

US Census Bureau, American Community Survey 5-Year Estimates Data Profiles, *Table DP03 Selected Economic Characteristics, 2023*, https://data.census.gov/table/ACSDP5Y2023.DP03?q=DP03:+Selected+Economic+Characteristics&g=050XX00US06059_160XX00US0628000, accessed August 26, 2025.

US Census Bureau, American Community Survey 5-Year Estimates Data Profiles*, Table DP04 Selected Housing Characteristics, 2023*, https://data.census.gov/table/ACSDP5Y2023.DP04?q=dp04&g=050XX00US06059_160XX00US0628000, accessed August 26, 2025.

US Census Bureau, American Community Survey 5-Year Estimates Data Profiles, *Table DP05 Demographic and Housing Characteristics, 2020*, https://data.census.gov/table?q=DP05&g=160XX00US0628000, accessed August 27, 2025.

US EPA, *Biennial Report Search*, https://enviro.epa.gov/envirofacts/br/search, accessed September 17, 2025.

US EPA, *Future of Climate Change*, https://www.epa.gov/climatechange-science/future-climate-change, accessed September 11, 2025.

US National Science Foundation, *Study finds that climate change could spark the next pandemic*, https://www.nsf.gov/news/study-finds-climate-change-could-spark-next, accessed September 11, 2025.

USACE, *Dam Safety Program*, https://www.usace.army.mil/Missions/Civil-Works/Dam-Safety-Program/Program-Activities/, accessed September 3, 2025.

USGS, *Alquist-Priolo Faults*, https://earthquake.usgs.gov/education/geologicmaps/apfaults.php, accessed September 9, 2025.

USGS, *Earthquake Hazard Program*, https://www.usgs.gov/glossary/earthquake-hazards-program#E, accessed September 9, 2025.

USGS, *Land Subsidence*, https://www.usgs.gov/mission-areas/water-resources/science/land-subsidence?qt-science_center_objects=0#qt-science_center_objects, accessed September 9, 2025.

USGS, *Magnitude/Intensity Comparison*, http://earthquake.usgs.gov/learn/topics/mag_vs_int.php, accessed September 17, 2025.

USGS, *Quaternary Fault and Fold Database of the United States*, https://earthquake.usgs.gov/cfusion/qfault, accessed September 19, 2025.

USGS, *St Francis Dam Disaster*, https://www.usgs.gov/media/images/st-francis-dam-disaster, published March 2024, accessed September 3, 2025.

USGS, *The Modified Mercalli Intensity Scale*, https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects, accessed September 17, 2025.

USGS, *Water Science School: Land Subsidence*, https://www.usgs.gov/water-science-school/science/land-subsidence, accessed September 9, 2025.

Voice of OC, *Transportation Authority Kept Secret Cyber Attacker That Cost $600,000*, https://voiceofoc.org/2024/06/santana-cyber-attacking-your-right-to-know/#:~:text=Here%20in%20Orange%20County%2C%20we%20have%20some%20experience,cybersecurity%20dealings%20with%20large%20agencies.&text=And%20thanks%20to%20the%20reporting,out%20computer%20servers%20for%20days., published August 2, 2016, accessed September 17, 2025.

Weather Spark, *Climate and Average Weather Year Round in Fullerton*, https://weatherspark.com/y/1846/Average-Weather-in-Fullerton-California-United-States-Year-Round, accessed September 12, 2025.

World Health Organization, *Vector-Borne Diseases*, https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases, accessed September 10, 2025.

World Health Organization, *WHO Covid-19 Dashboard*, https://data.who.int/dashboards/Covid19/deaths?n=o, accessed September 17, 2025.

Yeats, Robert. *Living with Earthquakes in the Pacific Northwest. Amplification of Seismic Waves by Soft Surficial Deposits*. https://geo.libretexts.org/Bookshelves/Seismology/Living_With_Earthquakes_in_The_Pacific_Northwest_%28Yeats%29/06%3A_Shaky_Ground_and_Big_Waves/6.01%3

A_Solid_Rock_and_Bowls_of_Jello/6.1.02%3A_Amplification_of_Seismic_Waves_by_Soft_Surficial_Deposits, accessed September 10, 2025.


FUL
E-6
FUL E-6