



CITY OF FULLERTON

Community and Economic Development Department

Item No. 3
March 12, 2025
6:30 p.m.
Public Hearing

**TO: Chair Dino and
Members of the Planning Commission**

APPLICATION

LRP-2024-0008

APPLICANT

City of Fullerton

LOCATION

Citywide

SUMMARY AND APPLICATIONS REQUESTED

A request to consider amendments to The Fullerton Plan (i.e., the General Plan) which updates the Safety Element as required by state law.

CEQA DETERMINATION

The proposed Safety Element (SE) update has been determined to be exempt from the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Section 15061(b)(3) ("general rule" or "common sense") as it can be seen with certainty that there is no possibility that the SE would have a significant effect on the environment.

AUTHORIZATION / GUIDELINES

Fullerton Municipal Code (FMC) Sections 15.72.040 and 15.72.050 authorize the Planning Commission to hold a public hearing to consider amendments to The Fullerton Plan and FMC and make a recommendation to City Council based on findings that the proposed amendments are consistent with state requirements.

Government Code Section 65302 requires every city in California to have a General Plan which contains mandatory sections or "elements" including but not limited to the Housing Element, the Safety Element, and the Open Space Element. Subsequently, Senate Bill (SB) 379 states that upon the next revision of The General Plan, cities are required to update the SE. The City completed the process of updating the Housing Element and received its letter of compliance from the Department of Housing and Community Development on February 27, 2025.

Lastly, SB 1241 revises the Safety Element requirements for state responsibility areas and very high fire hazard severity zones, as specified, and require the Safety Element, upon the next revision of the Housing Element on or after January 1, 2014, to be reviewed and updated as necessary to address the risk of fire in state responsibility areas and very high fire hazard severity zones, taking into account specified considerations, including, among others, the most recent version of the Office of Planning and Research’s “Fire Hazard Planning” document. The bill also requires cities to, at the next update of its General Plan guidelines, include these provisions, or a reference to these provisions and any other materials related to fire hazards or fire safety it deems appropriate.

PUBLIC OUTREACH

A Public Hearing Notice was published in the Fullerton News Tribune on February 27, 2025. The notice was also posted on the City’s website and at the Maintenance Services Department, Main Library, Museum Center, and City Hall on the Public Notice Boards. Lastly, an email blast was sent to over 400 individuals on a Community Development interest list. Attached are public comments received as of the date of this report (Attachment 2). Responses to these public comments are provided and did not necessitate modification of any of the proposed update materials (Attachment 3).

PROJECT BACKGROUND

The Safety Element focuses on understanding the hazards and safety issues that affect the community and ensures public safety concerns are adequately addressed. The quality of life in Fullerton is directly impacted by the sense of security of its residents and businesses. Addressing and reducing the risks associated with natural and human-induced hazards would further the City’s overall goal to provide a safe and enjoyable environment for its citizens.

The SE meets the requirements of California Government Code Section 65302(g) by setting forth goals and policies to protect and safeguard Fullerton residents from various disasters (further described below).

The Fullerton Plan uses a unique format and therefore the Safety Element update is contained over several sections of The Fullerton Plan and within related documents. This includes:

- Revised Goals (found throughout The Fullerton Plan)
- Fullerton Safety Element Supplement
- Local Hazard Mitigation Plan (updated in 2020)

Each item will be further described below.

ANALYSIS

Fullerton SE Update (Appendix I – Fullerton Safety Element Supplement)

State law requires that a city’s General Plan include a Safety Element to address protection of its people from unreasonable risks associated with disasters, including earthquakes, floods, fires, landslides, and other hazards identified by the local community. Goals and policies of the Safety Element address issues associated with hazard mitigation planning, disaster preparedness, emergency response, wildfires, geologic and seismic hazards, flooding, climate change, hazardous materials, law enforcement, and airport hazards.

The Fullerton Safety Element Supplement (to be Appendix I of The Fullerton Plan) addresses the aforementioned issues and provides additional text and mapping to ensure compliance with SB 1241 requirements (Attachment 1). This document is new and does not replace any pre-existing document. Disaster information, based on updated surveys and analysis, include the following:

- Evacuation routes
- Areas of liquefaction potential
- Areas of deep-seated landslide potential
- Fire hazard severity zones
- Areas of wildland urban interface
- FEMA identified flood zones
- Climate vulnerability assessment and adaptation framework

As previously mentioned, this document was updated to comply with state law.

Fullerton SE Update (Revised Goals)

The Fullerton Plan, as Fullerton’s General Plan, is the City’s fundamental governance document that guides decision-making, actions, programs, and crafting of more specific policies. It embodies community values and sets general direction for achieving The Fullerton Vision. The topics it addresses are wide-ranging, influencing many aspects of Fullerton.

Each Chapter, or Element, addresses a particular topic and contains at least one goal and multiple policies. Actions related to the goals are identified in Part III of The Fullerton Plan – The Fullerton Implementation Strategy.

Safety-related goals and policies are spread throughout the document. The majority of those can remain as is because they meet state requirements. There are also some being updated as necessary, and some new policies being added to fill in missing requirements to meet state law (see Attachment 5). The policies within the following Goals are being updated:

- Goal 7 - Growth and development aligned with infrastructure capabilities
- Goal 12 - Proactively addressing public safety concerns
- Goal 13 - Responsive to public safety needs
- Goal 18 - Citizens that are actively involved in shaping the community’s future and overall quality of life
- Goal 19 - An adequate, safe, and reliable water supply
- Goal 20 - A healthy watershed and clean urban runoff
- Goal 24 - Responsible management of open spaces balanced with the healthy functioning of environmental systems
- Goal 26 - Protection of people, natural and built environments and economy from natural hazards

In summary, this action is being done to ensure compliance with SB 1241 requirements.

Local Hazard Mitigation Plan

The Fullerton Local Hazard Mitigation Plan (LHMP) is both a reference document and an action plan. It has information and resources to educate readers and decision makers about hazard events and related issues, and a comprehensive strategy that the City and community members can follow to improve resiliency in Fullerton. The LHMP was developed to broadly increase resiliency in Fullerton and has the five following goals:

- Reduce and isolate threats to public safety and property in Fullerton.

- Maintain government operations and provisions of essential services to residents and stakeholders during and after a hazard event.
- Protect the natural environment through responsible stewardship of air, water, and open spaces in Fullerton.
- Promote resiliency and climate action in Fullerton through resilient infrastructure, responsive governance, and vibrant civic participation.
- Partner with surrounding local, regional, state, and federal jurisdictions in hazard mitigation efforts.

The City's LHMP was updated in 2020 and includes relevant content for addressing the state's SB 1241 requirements. No changes are proposed to the document at this time and is provided for reference (Attachment 4).

GENERAL PLAN CONSISTENCY

The request is consistent with the following Fullerton Plan goals and policies:

Goal 12: Proactively addressing public safety concerns.

P12.3 Community Confidence Building: Support policies and programs that bolster productive communication and problem-solving between public safety personnel and the Fullerton community.

Goal 26: Protection of people, natural and built environment and economy from natural hazards.

P26.1 Regional Coordination: Support projects, programs, policies, and regulations to coordinate planning for and response to natural disasters with other agencies within the region.

P26.3 Focus Area Planning: Support projects, programs, policies and regulations to consider natural hazard risks and mitigation as part of community-based planning of Focus Areas.

REQUIRED FINDINGS

General Plan Amendment

FMC Section 15.72.050 authorizes the Planning Commission to make a recommendation to City Council to approve a request for a General Plan Amendment upon making certain findings.

1. Will the requested Amendment be consistent with the objectives of the General Plan?

The 2024 Safety Element Update is consistent with the other Elements of the City's General Plan.

2. Will adoption of the requested Amendment be consistent with the goals and policies of The Fullerton Plan?

The 2024 Safety Element Update is an update of the City's General Plan as was prepared as required by and in accordance with state law (65302(g)) of the California Government Code).

RECOMMENDED ACTION

- Adopt Planning Commission Resolution No. PC-2025-02, entitled:

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF FULLERTON, CALIFORNIA, RECOMMENDING THAT THE CITY COUNCIL AMEND THE FULLERTON PLAN BY ADOPTING THE SAFETY ELEMENT (APPENDIX I) AND REPLACING GOALS 7, 12, 13, 18, 19, 20, 24 AND 26 OF THE FULLERTON PLAN AS PER EXHIBITS A AND B

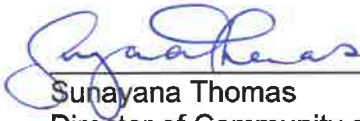
DATED: March 12, 2025

Prepared by:



Chris Schaefer, AICP
Planning Planner

Approved for Agenda by:



Sunayana Thomas
Director of Community and Economic Development

Attachments to Report:

1. Draft Planning Commission Resolution No. PC-2025-02 including Exhibits
2. Public Comments
3. Responses to Public Comments
4. Local Hazard Mitigation Plan
5. Policy Comparison
6. Board of Forestry and Fire Protection Safety Element Review
7. PowerPoint Presentation

Attachment No. 1

Draft Planning Commission Resolution No. PC-2025-02

RESOLUTION NO. PC-2025-02

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF FULLERTON, CALIFORNIA, RECOMMENDING THAT THE CITY COUNCIL AMEND THE FULLERTON PLAN BY ADOPTING THE SAFETY ELEMENT (APPENDIX I) AND REPLACING GOALS 7, 12, 13, 18, 19, 20, 24 AND 26 OF THE FULLERTON PLAN AS PER EXHIBITS A AND B

LRP-2024-0008

APPLICANT: CITY OF FULLERTON

WHEREAS, the City of Fullerton desires to amend its General Plan to update the Safety Element as required by State law (Section 65302(g) of the California Government Code); and

WHEREAS, the 2025 Safety Element Update contains new and expanded policies and implementation actions surrounding evacuation and wildfire, based on the results of the analysis conducted in compliance with Government Code Section 65302 (g) requirements. The Safety Element addresses a wide range of natural and human-caused hazards and consists of goals and policies aimed to reduce the risk associated with these hazards, such as loss of life, injuries, property damage, and economic and social dislocation. The update consists of a comprehensive update to the existing element, which was adopted on May 1, 2012. Since 2012, a number of revisions to the California Government Code have been enacted, which require an update of the Safety Element to be in compliance with SB 1241, SB 379 and SB 99 defined under State law (Section 65302(g) of the California Government Code) (the "Project"); and

WHEREAS, California Government Code Section 65302(g) requires an update to the Safety Element of the General Plan; and

WHEREAS, as part of the update, SB 379 compliance relies on the LHMP Update and the Climate Adaptation Vulnerability Assessment developed as part of this project, which ensures consistency with California Government Code Section 65302(g)(4); and

WHEREAS, the Safety Element Update, was initially submitted to the California Department of Forestry and Fire Protection (Cal Fire) on June 24, 2024, for preliminary review and comments, and on July 9, 2024, Cal Fire confirmed the Safety Element met Cal Fire requirements and allowed for the Safety Element Update to be submitted to the State Board of Forestry for certification; and

WHEREAS, the Safety Element Update, was submitted to the California Board of Forestry and Fire Protection Resource Protection Committee on July 9, 2024, and received approval by the Committee on July 23, 2024, allowing for the Safety Element Update to be adopted by the City; and

WHEREAS, pursuant to the provisions of the California Environmental Quality Act (Public Resources Code section 21000 et seq.; "CEQA") and the CEQA Guidelines (Title 14 California Code of Regulations section 15000 et seq.) an Exemption was prepared for the 2024 General Plan Safety Element update, which determined adoption of said General Plan Update will not result in significant impacts to the environment requiring mitigation measures; and

WHEREAS, the City of Fullerton has incorporated the 2020 Fullerton Local Hazard Mitigation Plan by reference, effectively integrating the plan into the General Plan Safety Element in conformance with Assembly Bill 2140 (Government Code 65302.6) making the City eligible for cost share assistance under the California Disaster Assistance Act; and

WHEREAS, the Planning Commission has had the opportunity to review this Resolution and finds it accurately sets forth the intentions of the City Safety Element Update; and

WHEREAS, in accordance with applicable provisions of law, the Fullerton Planning Commission held a public hearing on March 12, 2025, at which time the Fullerton Planning Commission heard and received all relevant testimony and evidence presented orally or in writing regarding the Project. All interested persons were given an opportunity to hear and be heard regarding the Project.

NOW, THEREFORE, BE IT RESOLVED that the Fullerton Planning Commission based on the evidence contained in the record for this matter, by the Fullerton Planning Commission as follows:

1. The foregoing recitals are true and correct and incorporated herein by this reference.
2. The 2024 Safety Element Update was deemed exempt from the requirements of CEQA and the CEQA Guidelines.
3. The 2024 Safety Element Update is an update of the City's General Plan as was prepared as required by and in accordance with State law (65302(g) of the California Government Code).
4. The 2024 Safety Element Update is consistent with the other Elements of the City's General Plan.

NOW, THEREFORE, the Planning Commission of the City of Fullerton, California recommends that the City Council adopt the Safety Element (Appendix I) and replace Goals 7, 12, 13, 18, 19, 20, 24 and 26 of the Fullerton Plan as per Exhibits A and B.

ADOPTED BY THE FULLERTON PLANNING COMMISSION ON MARCH 12, 2025.

Arnel Dino, Chairman

Attachments

Exhibit A – Safety Element (Appendix I of The Fullerton Plan)

Exhibit B – Goals 7, 12, 13, 18, 19, 20, 24 and 26 of The Fullerton Plan

Attachment No. 1
Exhibit A

Safety Element (Appendix I of The Fullerton Plan)



Appendix I: Fullerton Safety Element Supplement

The following document is intended to support the City's ongoing compliance with California Government Code 65302 (g) requirements requiring update to the General Plan Safety Element. In addition to this document, the City has prepared a Climate Adaptation Vulnerability Assessment (Attachment A) and a series of updated Goals, Policies, and Actions that have been incorporated into the General Plan.

The following link provides access to this document: [LINK](#)

5-15-2024

Fullerton Safety Element Supplement

Emergency Preparedness/Evacuation

The ability to anticipate, evaluate, and mitigate potential risks posed by natural and human-caused hazards is paramount to a city's longevity. Although this element specifically addresses natural and human-caused hazards, emergency preparedness involves many more considerations beyond identifying them. The Emergency Preparedness section consolidates and briefly describes the City of Fullerton's hazard prevention and response strategies.

Police Service

The Fullerton Police Department is comprised of two divisions: an Operations Division and a Support Services Division. Within the department, officers and civilians manage the daily tasks necessary to operate and provide a high level of service to the citizens of Fullerton. With approximately 180 employees (approximately 70% sworn positions), the Fullerton Police Department manages close to 50,000 calls for service annually.

Fire Service

Fire protection and emergency service for the city is provided by the Fullerton Fire Department (FFD). Services provided include fire protection, emergency response, medical aid, fire prevention and inspections, hazardous materials control, and community education programs. The department has approximately 80 full-time employees spread amongst 3 divisions: Administration, Prevention, and Operations. Operating from six stations throughout the city, the FFD covers an area of approximately 22.5 square miles.

These facilities, in conjunction with Police facilities, provide adequate emergency/disaster response capabilities for the City. *Exhibit 15: Police and Fire Protection Facilities*, found in the Public Safety Tables and Exhibits chapter of the Fullerton Plan, depicts the locations of these facilities in Fullerton. The FFD is responsible for community outreach and education regarding fire awareness and prevention information. This information focuses on at-risk populations, especially those portions of the population located within fire-prone areas.

Emergency Management

Emergency management is provided by the Office of Emergency Management (OEM), led by the Emergency Manager. OEM is tasked with helping our community and City organizations anticipate hazards and vulnerabilities and take measures to better plan and prepare for natural and human-caused disasters. OEM ensures City employees, residents, and businesses are prepared for disasters. The OEM is also responsible for the oversight and management of disaster and preparedness grants, the Community Emergency Response Team (CERT) and Radio Amateur Civil Emergency Services (RACES) volunteer programs, community outreach and engagement, training, and ensuring the City is meeting local, state, and federal requirements.

Preparedness

The Emergency Operations Plan (EOP) is primarily responsible for informing the City's emergency management strategies. The EOP incorporates detailed response plans for emergency events such as fires, earthquakes, floods, pandemics, and terrorist activities. These strategies are typically organized under four categories: mitigation, preparedness, response, and recovery. Preparedness activities ensure City Departments are adequately trained and prepared

for future hazard events. City preparedness activities focus on ensuring the City's Emergency Operations Center (EOC) is adequately supplied and staffed by trained personnel in the event of an emergency.

Response

Emergency response activities typically focus on actions necessary to save lives and prevent further property damage during an emergency/disaster. Many of these activities are conducted in tandem with the Fullerton Police and Fire Departments' standard emergency response procedures. To guide response activities, the City will rely on the EOP and work closely with volunteer organizations such as CERT, which helps orchestrate internal and external communications, logistics, and assistance during large-scale emergencies. If City resources become overwhelmed, the City will request support through the Operational Area using automatic aid and mutual aid agreements currently in place with the State, County, and neighboring jurisdictions. However, the City recognizes that mutual aid resources depend on availability and may be limited during a large regional incident. Therefore, consideration for strengthening self-sufficiency is a priority.

Recovery

Recovery activities typically occur after an emergency/disaster event. These activities focus on reestablishing services to any impacted areas, repairing and/or reconstructing damaged buildings and infrastructure, and aiding residents and businesses with permitting and approvals of building plans as part of the reconstruction process. Depending on the scale and type of incident, recovery could occur in specific community locations and/or require specialized expertise to address the issues created. Cleanup of hazardous wastes shall be considered part of the recovery from a major disaster event (fire, flood, landslide, or earthquake).

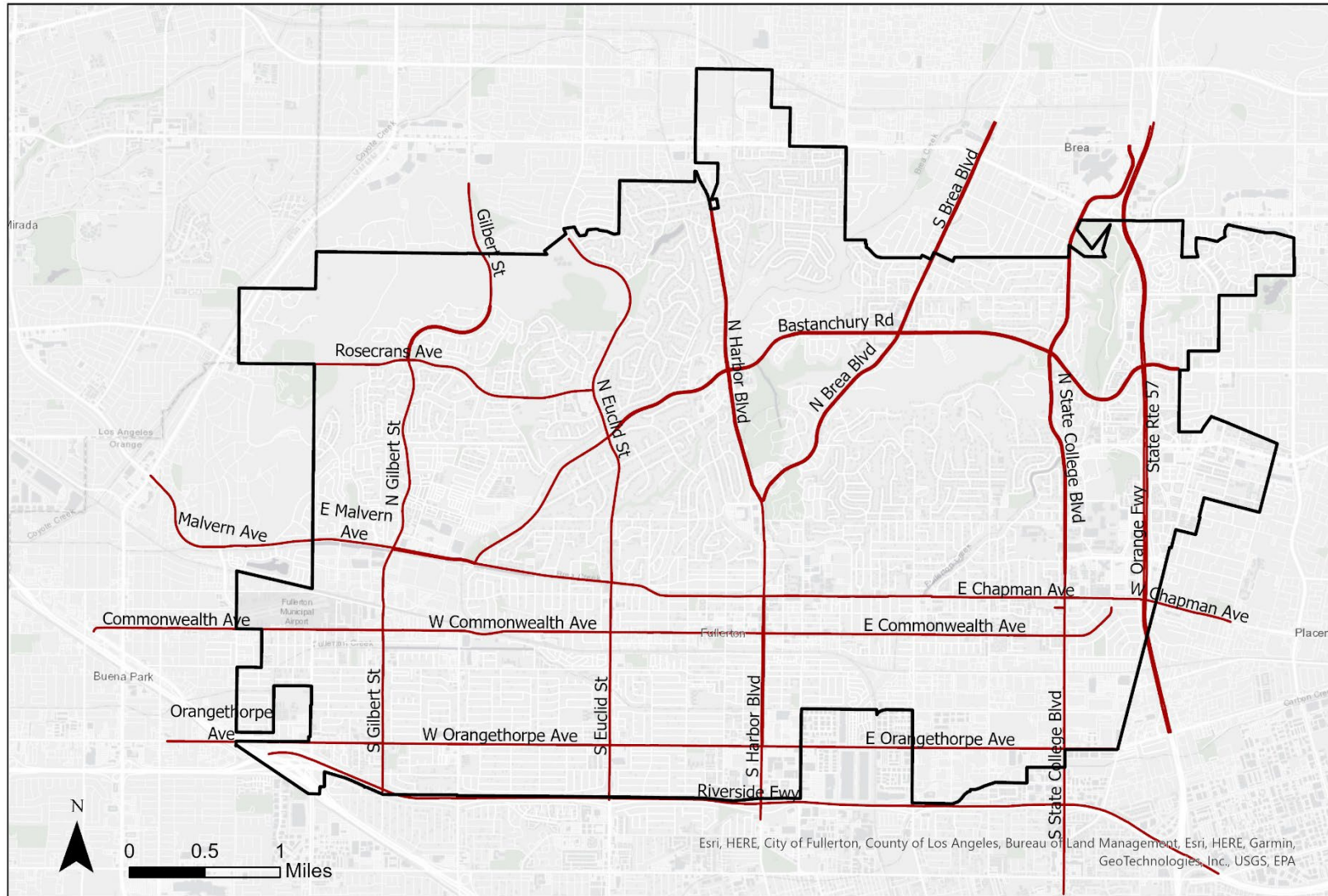
Mitigation

The EOP, in conjunction with the Fullerton Local Hazard Mitigation Plan, identifies and assesses the natural and human-caused hazards that threaten the City and recommends proactive policy and procedural actions that reduce the risks associated with these hazards. This preemptive planning is intended to decrease the probability of emergency situations and minimize the effects should one occur. The Local Hazard Mitigation Plan (LHMP) was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and followed FEMA's Local Hazard Mitigation Plan guidance. The LHMP incorporates a process where hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed to reduce or eliminate hazard risk. Implementing these mitigation actions, which include short- and long-term strategies, involves planning, policy changes, programs, projects, and other activities.

As part of the City's preparedness initiatives, an evacuation analysis has been prepared that identifies the routes used for evacuation purposes. **Exhibit 1** depicts the potential evacuation routes that could be used during a hazard event. These roadways are intended to meet evacuation needs; however, the City recognizes that some constraints may affect evacuation, namely narrow roadways, bridges, and railroad crossings. These locations may be vulnerable if failure or blockage occurs. **Exhibit 2** identifies constrained roadways (single ingress/egress conditions) and parcels that use these roadways (constrained parcels). These constrained locations are required to be identified by California Government Code Section 65302(g)(5) [SB99]. The mapping depicts both constrained access parcels (identified in orange), which are parcel groups of more than 30 individual parcels located on a constrained roadway. The map also depicts parcel groups of concern (identified in green), which are groups of between 20-29 individual parcels located along a constrained roadway. These parcel groups of concern are identified because of the potential to become constrained access parcels should new development or

redevelopment (construction of additional dwelling units, subdivision, etc.) occur in these areas. In the event of a natural hazard or other emergency, these areas of constrained access can potentially become much more difficult to evacuate should it become necessary.

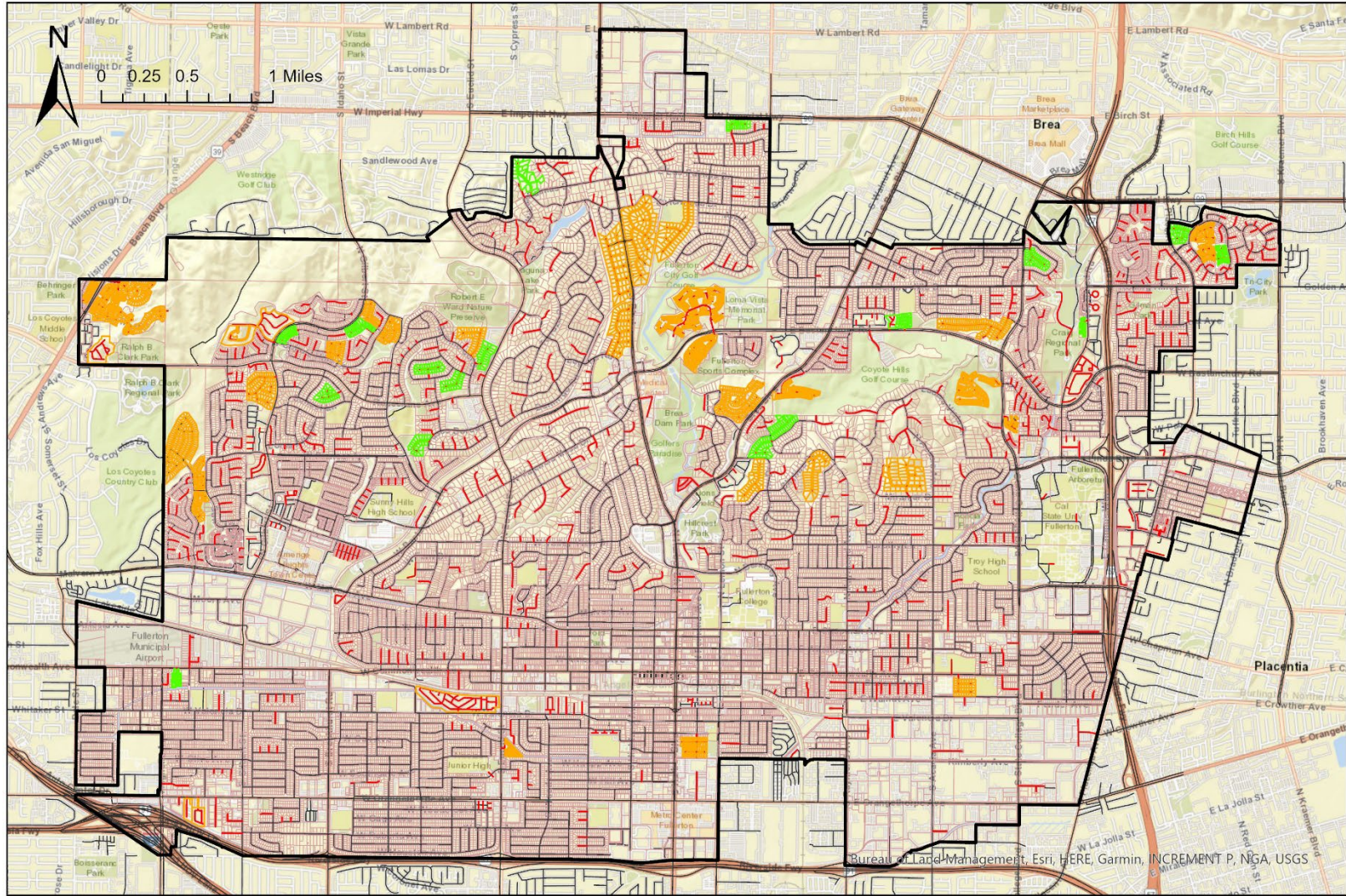
Exhibit 1- Potential Evacuation Routes in Fullerton



Legend

- Fullerton City Limit
- Evacuation Routes

Exhibit 2 – Constrained Roadways, Constrained Access Parcels, and Parcels of Concern



Legend

- Fullerton City Limits
- Roadway Network
- Constrained Access Parcels
- Fullerton City Parcels
- SB 99 Single Ingress/Egress Roads
- Parcels of Concern

Seismic Hazards: Fault Rupture, Seismic Shaking, Liquefaction

Seismic Hazards

Southern California is a seismically active region that experiences earthquakes regularly. Fullerton is prone to seismic hazards due to its location and proximity to active earthquake faults. Seismic hazards that can potentially affect the city are characterized as follows:

Fault Rupture

The Earth is covered in tectonic plates, which are large sections of the Earth's crust constantly shifting and moving closer together, further apart, or past one another. The movement of two plates past one another frequently causes friction, resulting in plates that "stick." When this occurs, the same forces that push the plates past each other are now concentrated in certain areas. In time, friction can no longer hold the plates together, and the plates suddenly shift, releasing a massive build-up of energy (i.e., earthquake). This rapid movement and release of energy can cause the Earth to fracture and displace the land around it, resulting in an earthquake fault. Some faults are buried beneath the surface, while others are located on the surface of the Earth. Surface rupture of a fault is especially dangerous if structures are built on top of the fault or infrastructure crosses the fault, as fault movement could damage these facilities. If a surface rupture occurs, the movement could break pipelines and damage roads and bridges, rendering them useless after the event. Areas of known surface rupture hazard in California are identified in Alquist-Priolo Special Study Zones. Fullerton has no Alquist-Priolo Special Study Zones within the city, reducing the concern associated with surface rupture.

Seismic Shaking

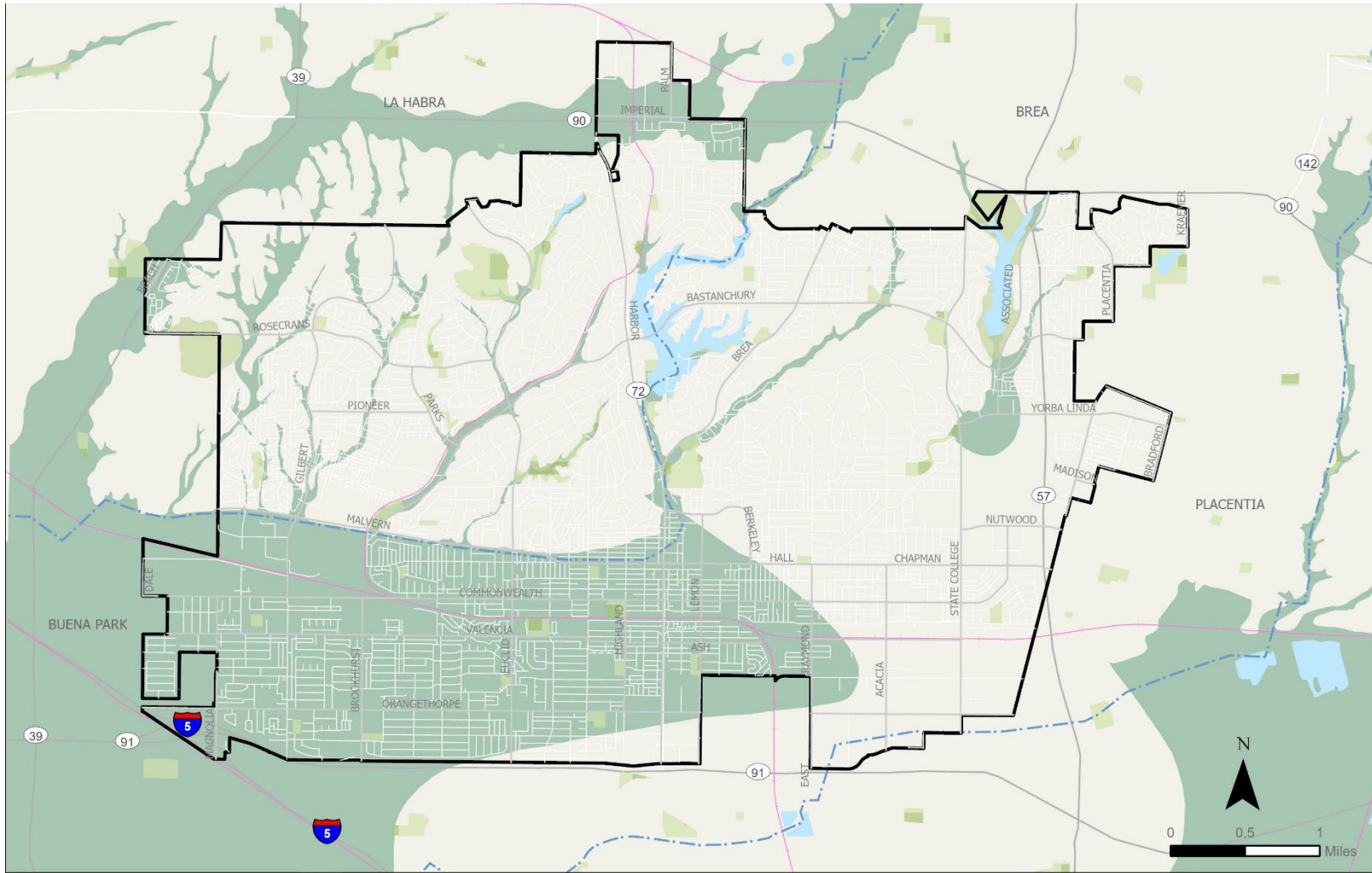
Seismic shaking is the recognizable movement caused by the energy released from an earthquake. The same mechanism that creates a surface rupture is also responsible for seismic shaking and can produce an equally devastating effect. Earthquakes may occur without surface rupture, which can still cause significant damage to buildings and other structures. Infrastructure such as roads, railways, pipelines, and power lines are also susceptible to damage and pose additional safety concerns. Unlike surface rupture, seismic shaking consequences are not restricted to the area immediately surrounding the fault. Energy resonating through the ground can travel hundreds of miles and simultaneously cause damage in many locations. The closer to the earthquake's source (epicenter), the stronger the shaking will be. Seismic shaking is of particular concern for the City due to the proximity to active faults that can generate significant earthquakes. The Puente Hills Fault is the closest fault to the city and is capable of generating a magnitude 6.7 to 7.5+ earthquake that could potentially damage buildings and infrastructure. Other notable faults include the San Andreas, Newport-Inglewood, and Whittier Fault zones. [Exhibit 26: Earthquake Hazards](#) in the Fullerton Plan (Page 207) depicts the locations of the local and regional faults in and near the city.

Liquefaction

Liquefaction is a phenomenon that occurs when intense vibrations from an earthquake cause saturated soil to lose stability and act more like a liquid than a solid. This poses significant problems for buildings and other structures in areas where liquefaction can occur, as the ground may give way under the weight of the structure and its foundation. In addition, underground structures are vulnerable to liquefaction. Most of the City lies within a low liquefaction risk zone; however, the Coyote Creek Floodplain in the northwest section of Fullerton contains areas susceptible to liquefaction based on the presence of saturated, loose sandy soils at depths less than 40 feet. **Exhibit 3** depicts the areas of the city potentially susceptible to liquefaction. Although the Carbon Creek alluvial fan is composed of loose, sandy material, susceptibility is considered low since groundwater is deeper than 50 feet below the surface. Since liquefaction occurs in areas

with saturated soils, areas of liquefaction with slopes are also known to trigger events known as "deep-seated landslides," which are landslides that occur when water accumulates in the soil underneath the slope's surface. The areas of West Coyote Hills and East Coyote Hills are susceptible to deep-seated landslides. **Exhibit 4** depicts the areas of the city potentially susceptible to landslides.

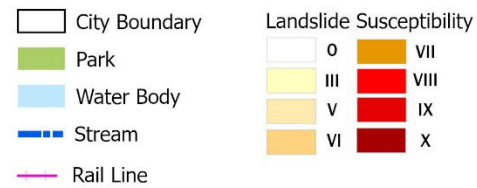
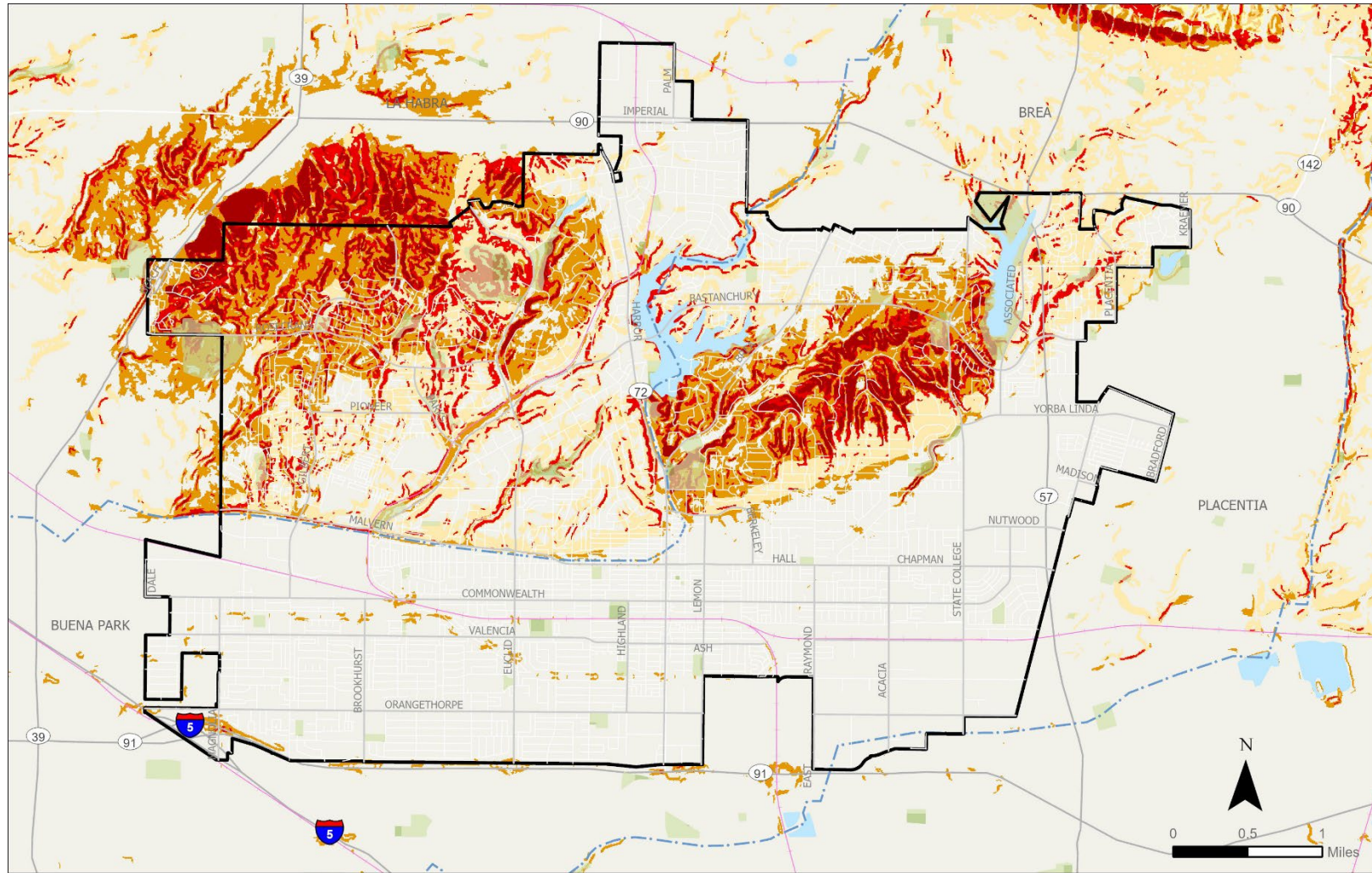
Exhibit 3 – Areas of Liquefaction Potential in Fullerton



- City Boundary
- Park
- Water Body
- Stream
- Rail Line
- Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements

Source: California Department of Conservation, ESRI, City of Fullerton

Exhibit 4 – Areas of Deep-Seated Landslide Potential in Fullerton



Source: California Department of Conservation, ESRI, City of Fullerton

Fire Hazards

Wildfires

The most common type of natural hazard in California is wildfire, which can quickly burn large areas of undeveloped or natural land. They often begin as smaller fires caused by lightning strikes, downed power lines, mechanical equipment use, or unattended campfires but may rapidly expand in size if conditions are dry and/or windy. The recent trend toward more prolonged periods of drought increases the likelihood of a wildfire. Typically, wildfires pose minimal threat to people and buildings in urban areas, but increasing human encroachment and development into natural areas increases the likelihood of bodily harm or structural damage. This encroachment occurs in areas called the wildland-urban interface (WUI), which is considered an area within a fire hazard severity zone, as defined by the California Department of Forestry and Fire Protection (CAL FIRE).

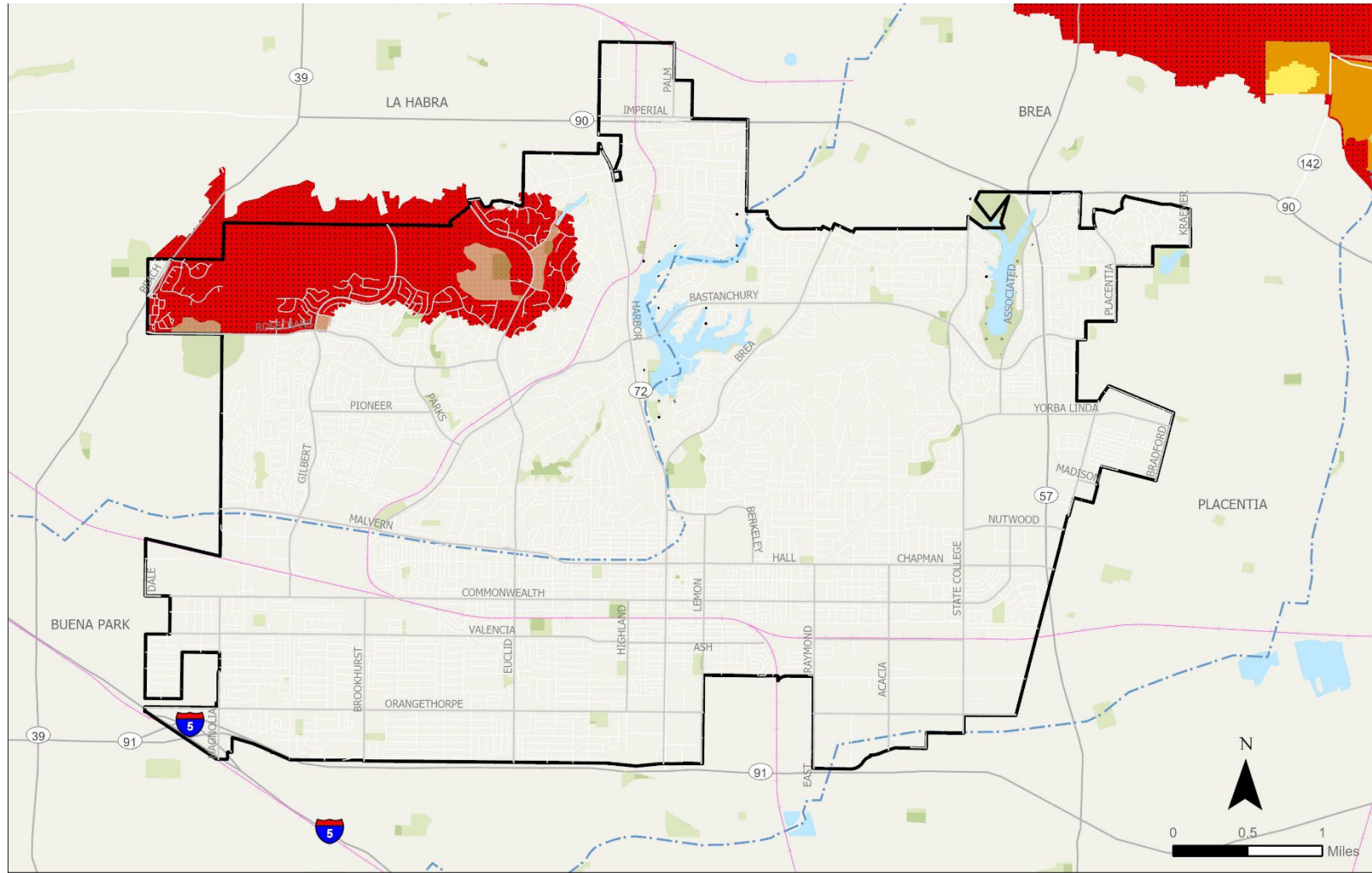
Significant wildfires have occurred in Orange County and neighboring communities in the past and pose a significant threat to people and property. Based on the current Fire Hazard Severity Zones mapping prepared by the CAL FIRE *Fire and Resource Assessment Program* (FRAP), the city's northwest area is identified within a Very High Fire Hazard Severity Zone. These areas are depicted in **Exhibit 5**. Properties located here and in some other smaller areas are susceptible to the threat of wildfires as they are located near open space areas and hillsides containing dense vegetation. These areas are located within the Local Responsibility Area (LRA), which is under the Fullerton Fire Department's (FFD) authority. The City has no State Responsibility Areas (SRA) or Federal Responsibility Areas (FRA), which fall under the authority of CAL FIRE and the U.S. Forest Service, respectively. However, the FFD does have multiple mutual aid agreements with neighboring jurisdictions in place, and the call for aid during large wildfires has been answered by the FFD throughout California. The most recent wildfires to affect the city occurred on October 30, 2019, including a brush fire near the Brea Dam, which was contained quickly. Later that same day, the Castlewood Fire broke out on the northeast corner of Castlewood Dr and Gilbert; approximately eleven acres were consumed before the fire was contained. **Exhibit 6** identifies the WUI areas and the locations of historic fires in Fullerton and the surrounding area.







Current and future development in the areas identified with fire hazard potential should be guided by prevention requirements, such as fire-resistant building construction and materials, adequate space between structures, available water supply, fire-resistant plant materials, quality of year-round firefighting service, available evacuation routes, access routes level enough for fire equipment use, and the creation and maintenance of fire breaks especially in areas of increased fire hazard.

Urban Fires

The possibility of an urban fire confronts every city. Many urban fires begin as isolated incidents caused by faulty electrical appliances, cooking mishaps, improper storage of chemicals, or industrial malfunction but can spread to other buildings if conditions permit. Many factors contribute to an urban fire's severity and extent, but modern building codes and practices have helped reduce their effects. Despite these improvements, it is important to acknowledge the risks associated with fires in urban areas. No matter its size, any fire can be fatal or cause severe harm to people and damage buildings and other structures.

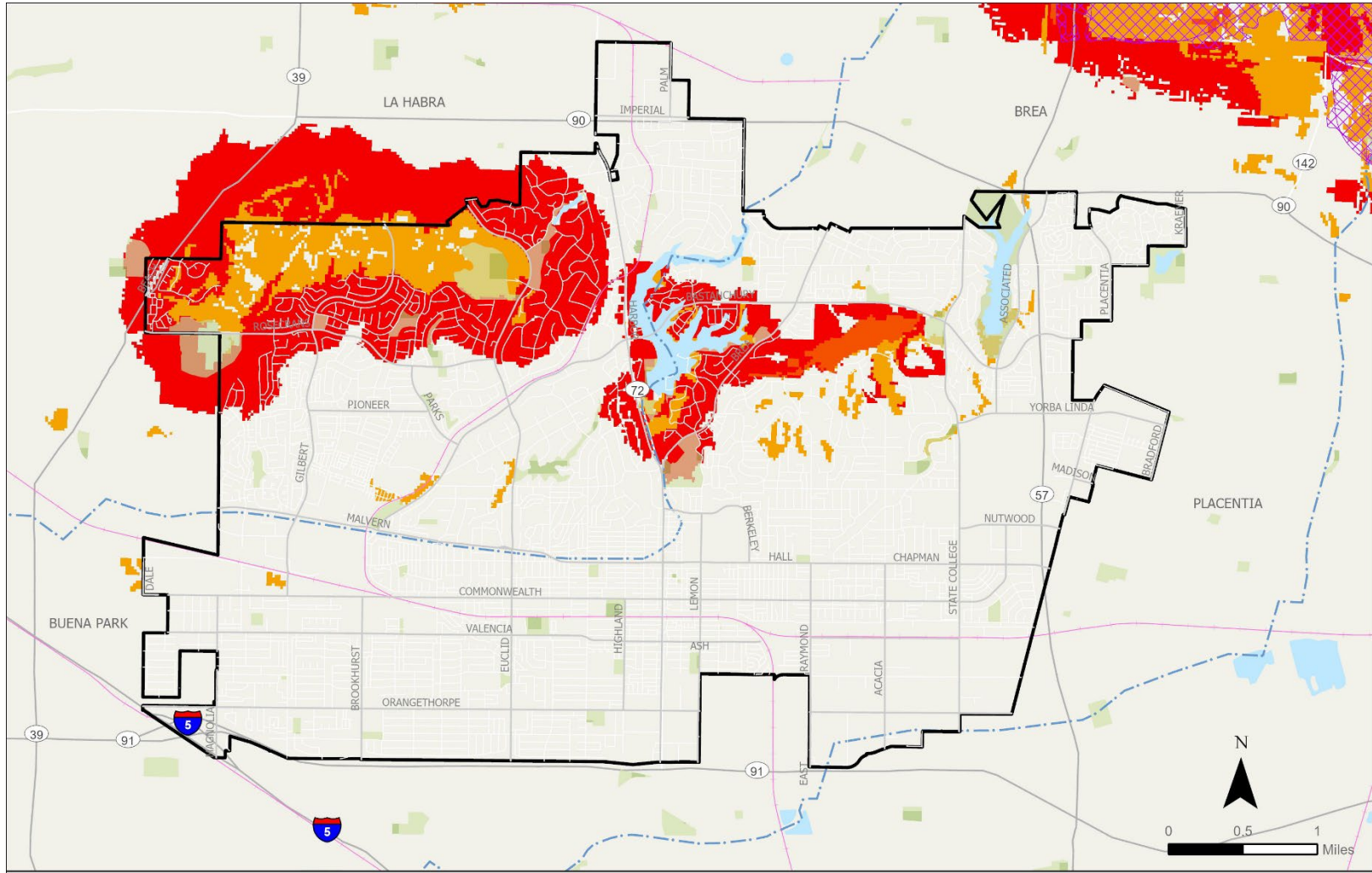
Exhibit 5 – Fire Hazard Severity Zones in Fullerton



-  City Boundary
-  Park
-  Water Body
-  Stream
-  Rail Line
-  Very High Fire Hazard Severity
-  LRA, Recommended Very High

Source: ESRI, City of Fullerton, California Department of Forestry and Fire Protection

Exhibit 6 – Wildland Urban Interface in Fullerton



- | | | |
|---------------|---|-------------------------|
| City Boundary | Wildland Urban Interface Variables | Historic Fire Perimeter |
| Park | Wildland Urban Interface | |
| Water Body | Wildland Urban Intermix | |
| Stream | Wildfire Influence Zone | |
| Rail Line | | |

Source: ESRI, City of Fullerton, California Department of Forestry and Fire Protection

Drought

A drought is a long period during which precipitation levels are significantly below normal. The most common effect is that plants dry out and become more susceptible to agricultural pests or diseases. An abundance of dry plant matter may also increase the risk of wildfires or cause fires to be more intense. In severe cases, droughts can affect urban areas. A significant drought can lead to water shortages, which may force local water suppliers to institute mandatory restrictions on nonessential water use. In extreme cases, there may be insufficient water to meet basic health and hygienic needs, requiring communities to find alternative water supplies. Since many communities receive their water from far-away sources, such as the Sierra Nevada or Colorado River, it is common in California to experience "long-distance droughts," where precipitation levels may be normal in the community itself but low at the source of the community's water. Droughts are large-scale events, so drought risks and conditions are generally equal across all of Fullerton.

Water Service

Fullerton is a retail water supplier that provides water to its residents and other customers using the imported potable water supply obtained from its regional wholesaler, Metropolitan Water District of Southern California (MET), and local groundwater from the Orange County Groundwater Basin (OC Basin), which is managed by the Orange County Water District (OCWD). The City meets all its demands with a combination of imported water and local groundwater. The City works with two primary agencies, MET and OCWD, to ensure a safe and reliable water supply that will continue serving the community in drought and shortage periods.

The city's main water source is groundwater from the Orange County Groundwater Basin. Even under the assumption of a drought over the next five years, MET's 2020 UWMP concludes a surplus of water supplies would be available to all its Member Agencies, including the City. The City has a purchase agreement with MET that allows it to purchase significantly more MET water should the need arise. MET's 2020 UWMP concludes that they can meet full service demands of their member agencies starting 2025 through 2045 during normal years, single dry year, and multiple dry years. Consequently, the City is projected to meet full service demands through 2045 for the same scenarios.

Severe Weather: Heat, Wind, Rain

Extreme Heat

An extreme heat event is a day when temperatures reach levels that are significantly higher than normal. In California, extreme heat has been defined as any day when the maximum temperature surpasses 98 percent of all prior historic high temperatures for the area, using the time between April and October from 1961 to 1990 as the baseline. Extreme heat events differ from region to region based on the area's climate. An extreme heat event in the Central Coast area of California will likely have a lower threshold than an extreme heat event in the Central Valley. A succession of extreme heat events is generally called a heat wave.

Windstorm

Wind is simply the movement of air caused by differences in atmospheric temperature. High-pressure air will naturally move to areas of low air pressure. Usually, the distance between these high- and low-pressure zones is far. However, these low- and high-pressure zones may occasionally be near one another. When this happens, air will flow dramatically, creating high-speed winds. When winds are fast enough, they can cause property damage to homes, public facilities, utilities, and other infrastructure. They can also uproot or topple mature trees or pick up debris and send it careening through the air. This debris can injure or even kill bystanders who

may find themselves stranded outside. High-speed winds can also deposit this debris in the middle of rights-of-way, such as roads, freeways, and railways, blocking exit routes for would-be evacuees or impeding access to first responders trying to reach wounded people.

Rainstorm

During severe weather events such as strong storms, rain can fall at such a high rate that it cannot drain away fast enough. The resulting heavy rain can cause flooding, leading to inundation and potential damage to buildings, road networks, public areas, utilities, and other critical pieces of infrastructure. In California, heavy rainfall events are often short, intense bursts of rain, but heavy rain can sometimes persist for multiple days.

Flood

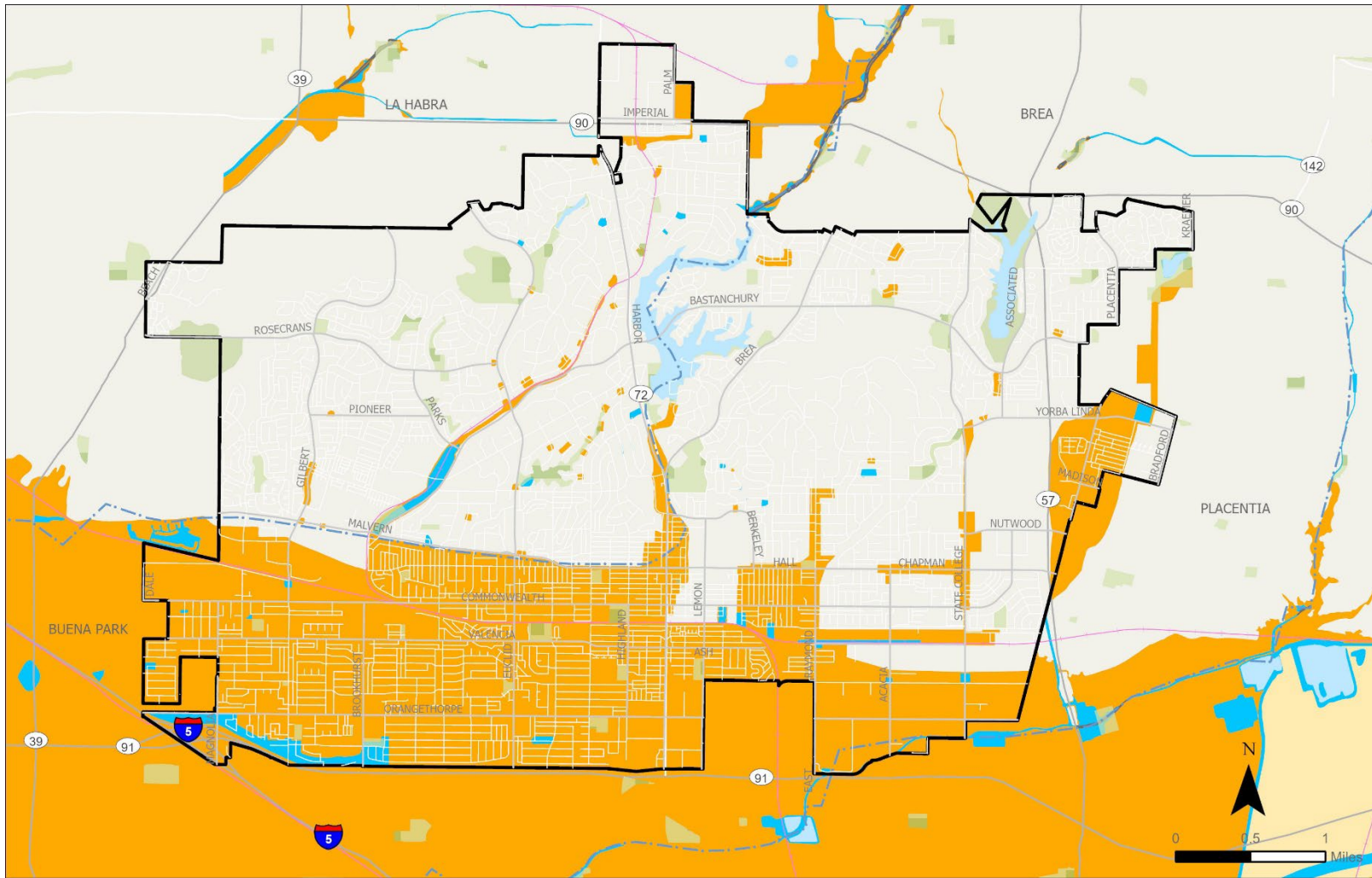
Heavy rains in Fullerton generally occur during the winter season when El Niño weather conditions or atmospheric rivers bring rain from other parts of the world to Southern California. Severe or prolonged heavy rain can lead to flooding in the city, particularly in areas with high amounts of pavement and other impervious surfaces. Floods are measured by their likelihood of occurrence. A 100-year flood has a 1 in 100 chance of occurring during any given year, while a 500-year flood has a 1 in 500 chance. Fullerton has 100- and 500-year floodplains designated and mapped by FEMA as flood zones. These FEMA flood zones are displayed in **Exhibit 7**.

Dam Failure

A dam failure occurs when a dam holding back the water of a reservoir can no longer control the collection of the water. A dam failure could result from a dam breach in which a section of the dam disintegrates, allowing the reservoir's waters to escape. A flood caused by a dam breach can move swiftly and be very powerful. Other hazardous situations, such as a major flash flood or strong earthquake, can trigger a dam failure, especially if the dam is aging or deteriorating. A mechanical malfunction can also cause a dam failure if the dam is not maintained or operated correctly. When assessing dam failure hazards, it is assumed that impacts occur based on a full reservoir.

Dam inundation maps show areas downstream that would be inundated by water from an unintentional release of water from a dam's reservoir. Five dams potentially threaten Fullerton: Fullerton Dam, Prado Dam, Carbon Canyon Dam, Orange County Reservoir, and Brea Dam. The areas at risk of inundation are located primarily in the southern areas of the city, along the eastern border and from the center of the city, and they all flow toward the southern edge of the city limits. These areas are depicted in [Exhibit 29 Dam Inundation Risks](#) in The Fullerton Plan (page 213).

Exhibit 7- FEMA Identified Flood Zones in Fullerton



- | | |
|---------------|---|
| City Boundary | Flood Hazard Zones |
| Park | 100-Year Flood |
| Water Body | 500-Year Flood |
| Stream | Area with Reduced Flood Risk Due to Levee |
| Rail Line | Floodway |

Geologic Hazards: Landslide/Mudflows, Subsidence

Although seismic events like earthquakes often trigger geologic hazards, this is not always the case. Therefore, understanding and preparing for these hazards as standalone events is equally important.

Landslides and Mudslides

A landslide is the movement of earth material down slopes and areas of steep topography. Although earthquakes often cause them, landslides can occur when a sloped surface can no longer support the material contained within or sitting above it. The sheer weight of the material can cause instability or can be rendered unstable by other events, such as heavy rain. When rain causes a slope to fail, the movement of earth materials is typically referred to as a mudslide.

Both landslides and mudslides can move with great force and pose a significant danger to buildings and other structures. In some circumstances, these events may cause bodily harm if bystanders cannot move out of their path in time. Anticipating the risk of landslides in the areas identified in **Exhibit 4** will be essential for protecting the community members who reside there. Due to the sloping topography, there is the potential for landslides in the steeper portions of the East and West Coyote Hills area. Even these areas, however, are designated as having a moderately low risk of landslides due to seismic conditions and a low likelihood of a landslide under other conditions.

Subsidence

Subsidence occurs when the ground level decreases as if the surface is sinking. Subsidence can either be sudden (as in a sinkhole) or happen gradually over time. It can be caused by mining, groundwater pumping, or fossil fuel extraction, creating empty underground spaces that can collapse and cause the soil above to drop. Erosion, natural cave collapses, and seismic activity can also cause subsidence. The City has identified that the most likely locations for subsidence in Fullerton are the northern and central portions of the city. Other sections of the city are potentially subject to subsidence in the event of a major earthquake (Mw 5.0 or greater); however, Fullerton does not have a history of seismically induced subsidence.

Hazardous Materials Release

Natural hazards are not the only threat to a community's safety. Human-caused dangers, such as various hazardous materials and wastes, are often found throughout a community and can pose significant risks. Some of these materials may be transported through the City via SR-57, SR-90, SR-91, and I-5. Generally speaking, hazardous materials are identified as toxic, flammable, explosive, corrosive, infectious, radioactive, or a combination of these characteristics. Hazardous wastes are categorized similarly but are identified separately from materials because they no longer serve a meaningful use.

In the Community

Although common household chemicals pose little threat to the community, hazardous materials and wastes used by businesses and industries present greater risks. Mechanical dealerships, repair shops, gasoline and diesel fuel stations, and dry cleaners are examples of businesses that regularly use and store chemicals or other hazardous materials. Pipelines and tanks within the city also transport and store chemicals that could pose a risk if a failure occurs. These releases are anticipated to be isolated to properties where storage occurs. Releases also tend to involve transporting raw materials and their byproducts by pipeline, rail, or truck. Regulation of the use,

storage, and transportation of hazardous materials and wastes rests on state and federal agencies; however, cities play a large role in minimizing the risks and impacts of exposure through careful planning and preparation. The city's primary risk to hazardous material spills comes from the various highways, a railroad right of way, the airport, the active oil wells in East Coyote Hills, and a major natural gas transmission pipeline that passes through the community and allows for the transport of potentially harmful chemicals and materials into and out of Fullerton.

In the Home

Exposure to hazardous materials is not uncommon, as many household cleaning products contain chemicals that can harm both humans and the environment. However, proper use can largely avoid the health risks associated with these hazardous materials. Properly storing household cleaning products and other common hazardous materials, such as those used in automotive and home repair, is also an important component of responsible management. Following the manufacturer's instructions on the packaging and keeping products out of the reach of children are two simple steps that can help reduce the risk of exposure.

Air Pollution

Air pollutants are substances in the atmosphere that affect our health. They include smoke, particles, and gases from human-made and natural sources. People generate air pollution in many ways — through the cars they drive, the stoves they cook on, and the fuel burned to produce heat and electricity. Air pollution from these sources may harm our hearts or lungs and reduce disease resistance. Air pollutants may cause diseases, especially those in the respiratory system. When certain air pollutants are breathed in, the airways to the lungs can become irritated. Continued exposure to air pollution may also cause a decrease in lung function. This is especially a problem in children whose lungs are still growing.

Climate Related Hazards

Although climate change is not a hazard, variations in environmental conditions can impact some of the natural hazards affecting Fullerton. Projections of future conditions include increased temperatures, increased extreme heat days, changes in precipitation, more prolonged droughts, and changes in the size and frequency of wildfire incidents. *Table 1* identifies the current/historical conditions and projected future conditions associated with climate change that could occur in Fullerton. Additional details regarding potential climate change effects are located in the City of Fullerton Climate Vulnerability Assessment (Attachment A).

Table 1: Potential Climate Change Effects for Fullerton	
Historic/ Current Conditions	Future Conditions
Annual Mean Temperature (1961-1990)	Annual Mean Temperature (2070-2099)
76.4° F	81.5 ° to 84.5° F
Extreme Heat Days (98.6° F)	Extreme Heat Days (2070-2099)
4 days per year (observed)	13 to 27 days per year
Annual Mean Precipitation	Annual Mean Precipitation (2070-2099)
13.8 inches (observed)	13.2 to 13.6inches
Annual Average Area Burned	Annual Average Area Burned (2070-2099)
65.4 acres	11.4 to 12.7 acres
Source: https://cal-adapt.org/tools/local-climate-change-snapshot	

Temperature

Increasing temperatures associated with climate change can act as a hazard multiplier. By the end of the century, annual mean temperatures are projected to increase between 5.1 and 8.1 degrees, impacting city residents and businesses. These increases are also anticipated to increase the number of extreme heat days from two days to between 13-27 days per year. These potential temperature increases may impact residents living in poorly insulated structures or structures that do not have air conditioning. For residents living in these structures, temperatures above 85 may cause discomfort. By the end of the century, the number of days over this temperature threshold could be nearly six times more than the city typically experiences.

While climate change is projected to exacerbate many of the hazards already affecting the city, many of these hazards may interact with each other. Increased temperatures can affect both water supplies and vegetation growth. With drier conditions, vegetation growth may be reduced, which can reduce wildfire vulnerability; however, if dry conditions persist for long periods, the reduced vegetation may be drier than normal. These two conditions may change the wildfire risks within and around the city or cause areas that have not burned historically to be at greater risk of ignition.

Precipitation

While temperatures are anticipated to increase in the coming decades, climate change projections suggest that annual mean precipitation may decrease slightly. While an annual decrease is projected, it is anticipated that future rain events may be more intense than what is currently experienced within the city, which could increase flooding. With changes in future precipitation, it is expected that changes to local vegetation may also occur, which could impact drainages and increase the need for slope stabilization management, wildfire management activities, and drainage infrastructure in some areas.

Increased rainfall could increase the amount of flooding within the community or introduce flooding into areas that have not experienced flooding before. The city could also experience increased landslides/mudslides with greater and more intense precipitation. Extreme precipitation events could destabilize hillsides, bluffs, and drainages, resulting in more erosion along drainage courses and landslides/mudslides. This could especially be true in areas where vegetation has been reduced or impacted by drought conditions.

With future temperature increases coupled with relatively similar precipitation amounts experienced today, future wildfire impact is projected to decrease by the end of the century. This projection is based on the overall reduction in small and moderate precipitation events instead of large or extreme events, suggesting that vegetation growth will experience an overall reduction. A reduction in vegetation could reduce future wildfire vulnerability due to reduced fuel loads and changes in fuel types and densities. Based on the historical fires, the city has experienced an annual average of 65.4 acres burned (total acreage burned divided by the number of years analyzed), which is projected to decrease to 12.7 acres or less by the end of the century.

Attachment A – Climate Adaptation Vulnerability Assessment

CITY OF FULLERTON

CLIMATE VULNERABILITY ASSESSMENT & ADAPTATION FRAMEWORK

Prepared for

City of Fullerton Department of Planning and Zoning

303 W. Commonwealth Ave.

Fullerton, CA 92832

Prepared by

Atlas Planning Solutions

This document includes the following chapters:

Chapter 1 – Introduction

This chapter describes climate adaptation planning and the applicable State requirements as they relate to this Vulnerability Assessment and Adaptation Framework.

Chapter 2 – Community Profile

This chapter provides a description of the City of Fullerton’s general environment and demographics. Special emphasis is made to discuss climate vulnerable populations.

Chapter 3 – Vulnerability Assessment

This chapter includes forecasts of each of the five climate-related hazards. It also maps where those hazards are most likely to affect the City of Fullerton.

This chapter evaluates the City’s current capacity to address the five climate-related hazards. This includes an assessment of the City’s current policies and programs and how they address the ability to respond to hazard events.

Chapter 4 – Adaptation Framework: Recommendations to Improve Resilience

This chapter includes potential strategies and policy recommendations to increase the City’s ability to adapt to hazards and meet the needs of its vulnerable communities.

The City of Fullerton’s Climate Vulnerability Assessment and Adaptation Framework is intended to inform the community about climate hazard exposure, sensitivity, and capacity to adapt to projected changes to the climate. The data collected and analyzed within this assessment represent a snapshot in time as of the date of this document and should be used as a guide, not a final determinant. Data collected from external, publicly available sources will have varying degrees of uncertainty and may contain some nonconformities, defects, inaccuracies, or errors that existed from the primary source. Although reasonable effort is made to present accurate information, the City of Fullerton makes no guarantee or warranty with respect to the information provided. The City, its employees, officers, content providers, affiliates, or other representatives are not liable for damages of any kind (including, without limitation, lost profits, direct, indirect, compensatory, consequential, exemplary, special, incidental, or punitive damages) arising out of your use of, your inability to use, or the content of this document, whether or not we have been advised of the possibility of such damages.

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EXECUTIVE SUMMARY

The City of Fullerton (City) recognizes that climate conditions are changing and will have profound effects on the community, ecosystem, and economy. Climate change may be a global phenomenon, but the impacts are felt locally. If greenhouse gas emissions continue at current levels globally, the City's average temperatures are expected to warm by 5-9° F by the end of the century, potentially leading to extreme heat events and drought and exacerbating wildfire conditions.

The City is addressing greenhouse gas emissions reductions through Green Projects to meet the City's Climate Action Plan goals. These sustainability initiatives outline actions the City and partners will take to reduce greenhouse gas emissions. In a parallel effort, the City is evaluating climate vulnerabilities and planning climate adaptation strategies to help the economy and environment, as well as the health of its residents, become more resilient. The City recognizes that the hazards influenced by climate change will not affect all residents and assets evenly, as vulnerability depends on existing stressors, potential climate impacts, and existing adaptive capacity. In creating this assessment and adaptation framework, the existing exposure and adaptive capacity were considered in evaluating climate vulnerability.

The vulnerability assessment revealed the following hazards have, and will continue, to impact the region:

- Wildfire risk to forests, affecting wildlife, natural areas, recreation, and public health
- Flooding that displaces residents, damages critical infrastructure, and disrupts the economy
- Extreme heat events that cause public health emergencies for vulnerable populations
- Drought that limits water supply and can exacerbate wildfire and landslide conditions

Additionally, all climate-induced hazards have the potential to:

- Risk lives, property, and homes
- Increase mental health impacts and associated trauma
- Overburden emergency services
- Overburdened infrastructure (e.g., electrical blackouts and damage to electrical infrastructure)
- Increase utility and insurance costs
- Overburden non-profit organizations from the increasing demand for services
- Limit outdoor recreation, potentially lowering revenue from tourism

Preparing for the impacts of climate change requires significant investment in time and resources across the region, including emergency services, infrastructure improvements, and expanded social and environmental programs. New, bold, and adaptable approaches to how people live, move, and manage vital resources are needed. Assessing climate vulnerabilities and developing an adaptation framework is the first step towards greater climate resilience for the City of Fullerton.

CHAPTER 1. INTRODUCTION

According to the State of California’s Legislative Analyst’s Office:

“Addressing the widespread impacts of climate change represents a significant challenge for the State. A changing climate presents California with five key climate hazards: (1) higher temperatures and extreme heat events, (2) more severe wildfires, (3) more frequent and intense droughts, (4) flooding due to extreme precipitation events, and (5) coastal flooding and erosion from sea-level rise. These hazards will threaten public health, safety, and well-being—including from life-threatening events, damage to public and private property and infrastructure, and impaired natural resources.”¹

To address the potential impacts from these hazardous events on the community, the City is expanding upon its climate action and hazard mitigation planning efforts to: 1) focus on climate change adaptation by understanding the community’s vulnerabilities to climate hazards; and 2) explore strategies to reduce the vulnerability to projected climate change effects, increase the local capacity to adapt, and build resilience.

Note the data, policies, guidance, and regulations discussed herein may become out of date over time as climate change and hazard data is updated and new policies, guidance, and regulations pertaining to climate change hazards are released.

Regulatory Drivers and Guidance for Climate Adaptation Planning

The report includes a Climate Vulnerability Assessment and Adaptation Framework, which will be incorporated into the City’s General Plan Safety Element, in compliance with SB 379, Government Code section 65302(g)(4)² and the Office of Planning & Research’s (OPR) General Plan Guidelines. According to SB 379, General Plan Safety Elements must address climate change vulnerability, adaptation strategies, and emergency response strategies. SB 379 states:

“This bill would, upon the next revision of a local hazard mitigation plan on or after January 1, 2017, or, if the local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2022, require the Safety Element to be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to that City or city. The bill would require the update to include a set of goals, policies, and objectives based on a Vulnerability Assessment, identifying the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, State, regional, and local agencies.”

As specified in Government Code section 65302(g)(4)(A) Vulnerability Assessments must identify the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, utilizing federal, state, regional, and local climate vulnerability documentation such as the California Adaptation Planning Guide and the Cal-Adapt climate tool created by the California Energy Commission (CEC) and University of California, Berkeley Geospatial Innovation Facility. Other sources of information include data from local agencies regarding their adaptive capacity and historical data on natural events and hazards. Per Government Code section 65302(g)(4)(B), adaptation policies, goals, and objectives are to be developed based on findings from the Vulnerability Assessment.

¹ Legislative Analyst’s Office (LAO). 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. <https://lao.ca.gov/Publications/Report/4575>. Accessed December 11, 2023.

² SB 379 was enacted to integrate climate change adaptation into California’s general plan process.

Additionally, Government Code section 65302(g)(4)(C) requires jurisdictions to create a set of feasible implementation measures to reduce climate change impacts on new or proposed land uses.

AB 162 (2007) Gov Code 65302(g)(2)

AB 162 requires that, upon the next revision of the housing element on or after January 1, 2009, cities and counties address flood hazards and safety in the land use, conservation, safety, and housing elements of their general plans.

SB 1241 (2012) Gov Code 65302(g)(3)

SB 1241 revised the Safety Element requirements to require all cities and counties whose planning area is within the State responsibility area (SRA) or very high fire hazard severity zones (VHFHSZs), as defined by California Department of Forestry and Fire Protection (CAL FIRE), to address and incorporate specific information regarding wildfire hazards and risk, and policies and programs to address and reduce unreasonable risks associated with wildfire. Upon the next revision of the Housing Element on or after January 1, 2014, the bill requires those cities and counties to review and update the Safety Element to consider the advice in the Office of Planning and Research's most recent publication of "Fire Hazard Planning, General Plan Technical Advice Series" as well as: information regarding fire hazards, a set of goals, policies, and objectives based on identified fire hazards, and a set of feasible implementation measures designed to carry out those goals, policies, and objectives.

SB 1000 (2016) Gov Code 65302(h)

SB 1000 stipulates those cities and counties with Disadvantaged Communities, as defined by SB 1000 in Government Code Section 65302(h), incorporate environmental justice policies in their general plans through either a stand-alone element, or by integrating relevant goals, policies, and objectives throughout other elements. The bill requires cities and counties to identify Disadvantaged Communities (as defined in SB 1000), include policies and objectives to reduce unique or compounded health risks in Disadvantaged Communities, promote civic engagement in the public decision-making process, and address the needs of Disadvantaged Communities. Compliance with SB 1000 is triggered when two or more elements in a general plan are revised after January 1, 2018.

SB 1035 (2018) Gov Code 65302(g)(5)

SB 1035 requires regular updates to the Safety Element chapter of the General Plan. The latest information regarding flood and fire hazards must be included and climate change adaptation and resilience must be addressed as part of the update. After 2022, Safety Elements must be updated upon each revision of the housing element or local hazard mitigation plan, but no less often than once every 8 years. Housing element revisions are typically on 4–8-year cycles and LHMP revisions are on 5-year cycles.

SB 99 (2019) Gov Code 65302(g)(5)

SB 99 requires that, upon the next revision of the housing element on or after January 1, 2020, the Safety Element must be updated to include information identifying residential developments in hazard areas that do not have at least two emergency evacuation routes (i.e., points of ingress and egress).

AB 747 (2019) Gov Code 65302.15

AB 747 requires that, upon the next revision of a LHMP on or after January 1, 2022, or beginning on or before January 1, 2022, if a local jurisdiction has not adopted a LHMP, the Safety Element must be reviewed and updated as necessary to identify evacuation routes and their Capacity, safety, and

viability under a range of emergency scenarios. If a LHMP, emergency operations plan, or other document that fulfills commensurate goals and objectives, a local agency may use that information in the Safety Element to comply with this requirement by summarizing and incorporating by reference such a plan or other document into the Safety Element.

Consistent with Government Code 65302(g)(4)(A), the following Vulnerability Assessment and adaptation framework also takes guidance from:

California’s Fourth Climate Assessment (2018)

California Natural Resources Agency (CNRA), OPR, and CEC prepared California’s Fourth Climate Assessment in 2018. The Climate Assessment was designed to present findings in the context of existing climate science, including strategies to adapt to climate impacts and key research gaps needed to spur additional progress on safeguarding California from climate change.

Safeguarding California Plan (2018)

CNRA released an update to the Safeguarding California Plan in 2018, providing a roadmap for State government action to build climate resiliency. The Safeguarding California Plan presents overarching strategies and outlines ongoing actions and cost-effective and achievable next steps to make California more resilient to climate change.

California Adaptation Planning Guide (2020)

The California Office of Emergency Services (Cal OES) released the second version of the Adaptation Planning Guide in 2020 - APG 2.0 - which includes updated guidance, an increased focus on equity and outreach, and best practices. The APG is designed to help local government, regional entities, and climate organizations incorporate best practices and current science and research into their adaptation plans.³

California Office of Planning and Research Fire Hazard Planning Technical Advisory (2022)

The goal of the technical advisory is to provide a robust planning framework for addressing fire hazards, reducing risk, and increasing resilience across California’s diverse communities and landscapes.

LOCAL AND REGIONAL CLIMATE PLANNING

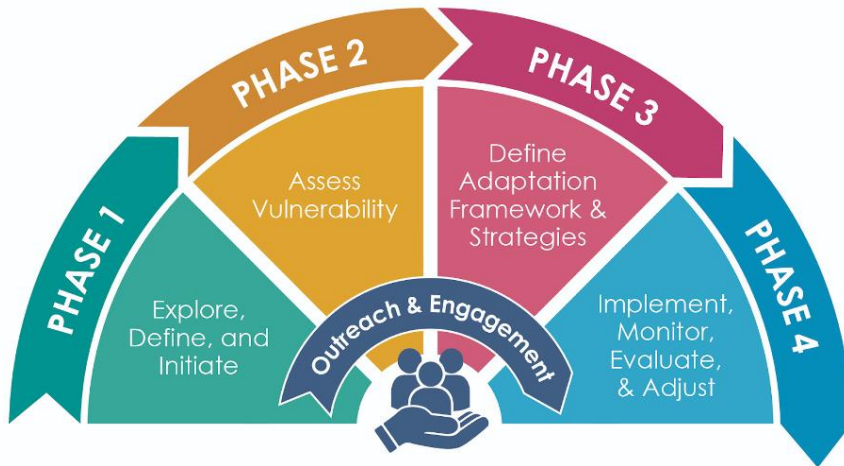
Historical climate or climate-related assessments evaluated under this effort include:

- Fullerton Local Hazard Mitigation Plan (2020)
- Orange County County-Wide Community Wildfire Protection Plan (2017)
- California’s Fourth Climate Change Assessment (2018)
- California Governor’s Office of Emergency Services State Hazard Mitigation Plan (2023)
- Federal Emergency Management Administration National Risk Index (2023)

Methodology and Planning Process

³ California Governor’s Office of Emergency Services (Cal OES). California Adaptation Planning Guide. June 2020.

The APG 2.0 provides a four-step process that communities can use to plan for climate change. The APG is designed to be flexible and guide communities in adaptation planning.



Source: California Governor’s Office of Emergency Services, 2020.

Phases of the Adaptation Planning Process include:

- Phase 1, Explore, Define, and Initiate:
This phase includes scoping the process and project, such as identifying the potential climate change effects and important physical, social, and natural assets in the community.
- Phase 2, Assess Vulnerability:
This phase includes analysis of exposure to, sensitivity of, and adaptive Capacity to respond to climate effect to determine physical and social vulnerability.
- Phase 3, Define Adaptation Framework and Strategies:
This phase focuses on creating an adaptation framework and developing adaptation strategies based on the results of the Vulnerability Assessment. The adaptation strategies are the community’s potential response to the Vulnerability Assessment.
- Phase 4, Implement, Monitor, Evaluate, and Adjust:
In this phase, the adaptation framework is implemented, consistently monitored and evaluated, and adjusted based on continual learning, feedback, and triggers.

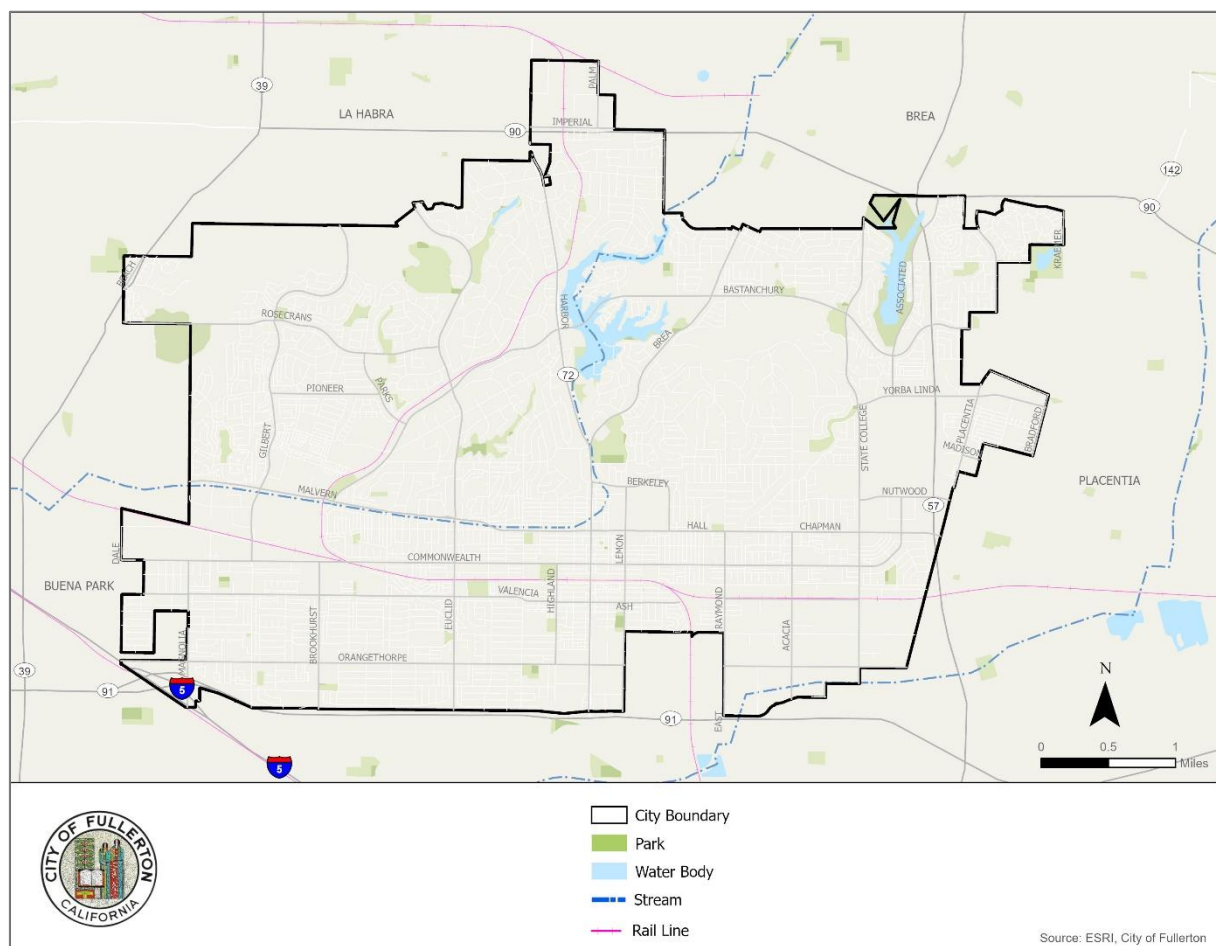
The purpose of this report is to document Step 1 through Step 3. The Vulnerability Assessment and development of adaptation measures follows the approach recommended by APG 2.0.

The Vulnerability Assessment identifies projected climate change exposures for the City at mid- to late-century timeframes. In addition to identifying the City’s exposure to the effects of climate change, the Vulnerability Assessment evaluates the sensitivity of key population groups and major community elements to climate change and associated hazards.

CHAPTER 2. COMMUNITY PROFILE

The region is characterized by a Mediterranean climate with hot, dry summers and cool, wet winters. This famously pleasant climate influences all aspects of life in the LA region. Countless ecosystems thrive throughout the region’s coasts, mountains, and interior landscapes. Substantial agricultural production occurs here, taking advantage of the bountiful sunshine and generally warm temperatures. Snow-based water from the Sierra Nevada (and Colorado Rockies) have, to date, largely satisfied the region’s huge residential, industrial, agricultural, and ecological freshwater demands. A complex web of generation and transmission systems has also provided enough energy to power to the region’s vast population.⁴

Figure 2-1: City of Fullerton



⁴ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

Table 2-1: Demographics displays the population characteristics in the City.⁵ 48.5 percent of the households have a household income of greater than \$100,000 per year, with 16.3 percent of households having an income of more than \$200,000 per year. A higher income tends to correlate with a greater ability to adapt to climate change (e.g., have and afford air conditioning). However, 11.2 percent of the population is living below poverty (based on national-level data) and almost one-third of the population is over the age of 65. An additional concern for emergency response planning (e.g., evacuation in case of flooding) is that 21.2 percent of households have at least one person living with a disability.

Table 2-1: Demographics City of Fullerton Orange County

	City of Fullerton	Orange County
Total Population**	144,363	3,212,746
Percent of residents that are children (less than 10 years old)*	10.6%	10.4%
Percent of households that have people 65+ years old*	28.2%	30.7%
Percentage of households with at least one person living with a disability*	21.2%	20.3%
Median age**	36.3	38.0
Total households**	48,739	1,088,611
Median household income**	\$96,047	\$105,327
Percent of rental households**	49.7%	42.8%
Percent of household income below poverty level*	11.2%	9.6%

Source: *US Census Bureau, ACS 2017 – 2021, **ESRI Forecasts 2023 based on US Census Bureau 2020 Summary File 1

Vulnerable Communities

Compared to the region, the City’s population is younger by a little more than 1.5 years (see **Table 2-1: Demographics**). While percentage of the population under age 5 or aged 65 years and older is similar between the City and region (see **Table 2-2: Age Distribution Comparison**) illustrating that the City’s vulnerable population (considering age only) is similar to the region.

Table 2-2: Age Distribution Comparison City of Fullerton Orange County

	City of Fullerton	Orange County
Under 5	5.1%	5.5%
5 - 14	11.3%	12.2%
15 - 24	15.9%	13.2%
25 - 34	16.1%	14.8%
35 - 44	12.7%	13.6%
45 - 54	12.1%	12.5%
55 - 64	11.6%	12.1%
Over 65	15.4%	16.0%

Source: ESRI Forecasts 2023 based on US Census Bureau 2020 Summary File 1

In California, the percentage of persons of retirement age (i.e., 65 years and older) are expected to grow more than twice as fast as the total population, and this growth will vary by region. This means

⁵ Data for vulnerable populations was extracted from a combination of US Census Bureau American Community Survey 2017 – 2021 estimates and ESRI’s Business Analyst 2023 forecasts. Data sources have been noted in each demographic table.

that people are living longer, and the aging population is increasing. This trend is also evident in the City, where the population aged 65 years and older grew by 32 percent from 2010 to 2022.⁶

The racial and ethnic composition of a population may affect housing needs because of cultural preferences associated with different racial/ethnic groups. Cultural influences may reflect preference for a specific type of housing and household structure. Research has shown that number and share of Americans living in multigenerational family households have continued to rise. In 2016, a record 64 million people, or 20 percent of the U.S. population, lived with multiple generations under one roof.

Figure 2-2: Population Age 65 and Older – City of Fullerton

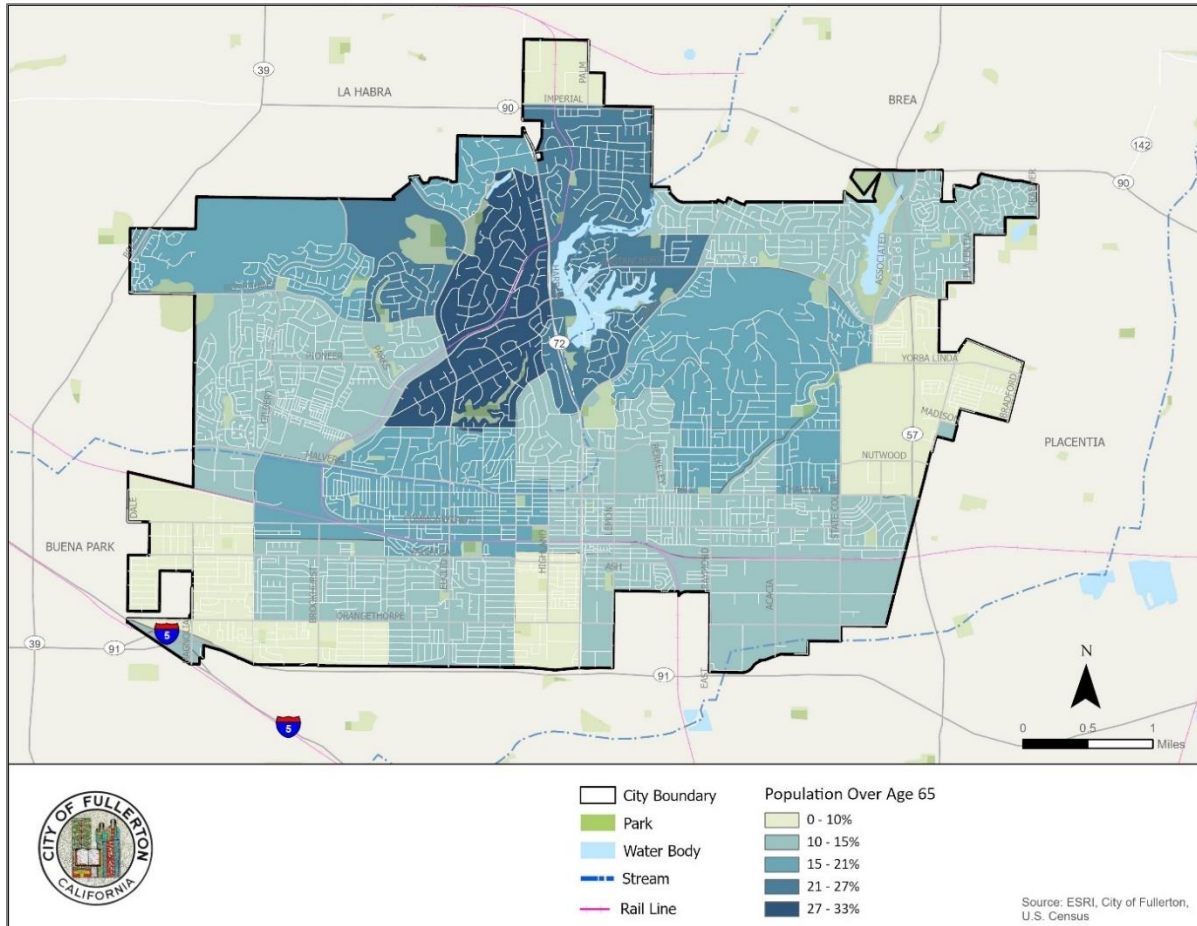


Table 2-3: Race and Ethnicity and **Figure 2-3: Communities of Color in City of Fullerton** illustrate that the ethnic distribution of the City’s population was predominantly people identifying as White Alone or Asian Alone with the combined cohorts representing two-thirds of the total. The City differs from the entire region in the proportion of people identifying as Asian Alone and White Alone, with a greater proportion of people identifying as Asian Alone and a smaller proportion identifying as White Alone. Approximately 39.4 percent of the City’s total population was of Hispanic origin compared to 35.2 percent for the region.

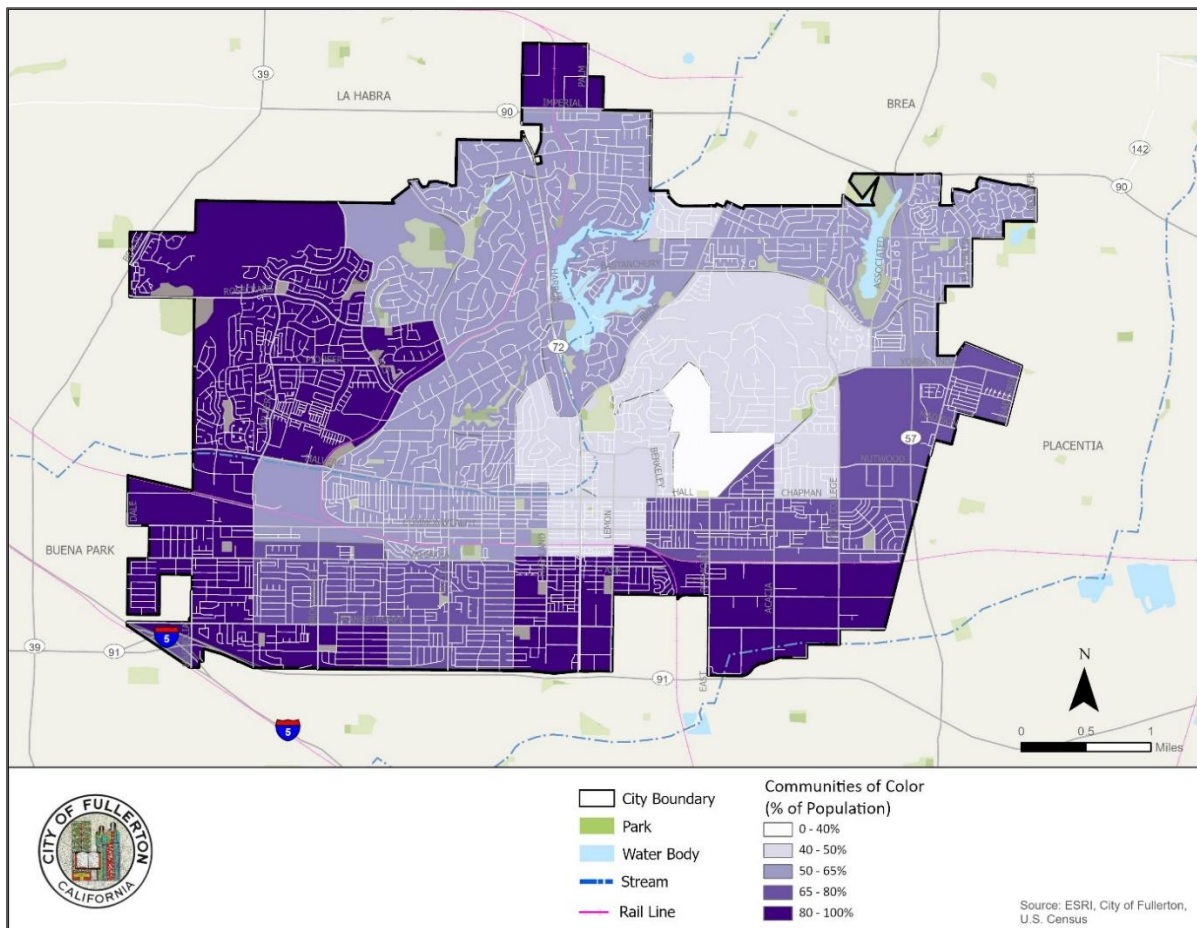
⁶ ESRI Forecasts 2023 based on US Census Bureau 2020 Summary File 1

Table 2-3: Race and Ethnicity

	City of Fullerton	Orange County
White Alone	34.5%	41.5%
Black Alone	2.3%	1.7%
American Indian Alone	1.3%	1.2%
Asian Alone	27.2%	23.1%
Pacific Islander Alone	0.2%	0.3%
Some Other Race Alone	19.2%	17.8%
Two or More Races	15.2%	14.4%
Hispanic Origin (Any Race)	39.4%	35.2%

Source: ESRI Forecasts 2023 based on US Census Bureau 2020 Summary File 1

Figure 2-3: Communities of Color in City of Fullerton



The Fullerton community is diverse with multiple languages spoken. As shown in **Table 2-4: English Proficiency and Languages Spoken at Home Among Residents 5 Years and Older – City of Fullerton**, the majority of residents aged 5 years and older are fluent in English; however, 7.6 percent of the population identify as not able to speak English “very well” or “well”. There are potential ramifications to vulnerability if emergency preparedness and climate resiliency programs do not provide information or services in languages besides English.

Table 2-4: English Proficiency and Languages Spoken at Home Among Residents 5 Years and Older – City of Fullerton

	Number of Speakers	Percent Not Fluent in English
English Only	73,501	-
Spanish	32,222	18.6%
Other Indo-European Languages (excluding English and Spanish)	4,116	6.6%
Asian and Pacific Island Languages	22,072	23.0%
Other Languages	1,577	20.0%

Note: Percentage values rounded to nearest tenth decimal.

Source: US Census Bureau, American Community Survey 2017 - 2021, ESRI 2023

2.1 VULNERABLE POPULATIONS

Climate change disproportionately affects those with existing disadvantages. Low-income communities and communities of color often live in areas with conditions that expose them to more severe hazards, such as higher temperatures and worse air quality. These communities also have fewer financial resources to adapt to these hazards. For instance, low-income populations are already disproportionately burdened by energy bills and may reduce air conditioning usage out of concerns about cost. People with chronic medical conditions are often more physiologically susceptible to negative health impacts from extreme heat and poor air quality, and those with mobility issues are particularly at risk. These risk factors are often present in older adults, who are more likely to have a limited income, chronic health conditions, and mobility limitations, and are more likely to experience social isolation.⁷

Factors such as age, physical and mental condition, socioeconomic status, access to key services (e.g., public or private transportation), and other factors affect the ability of people to prepare for and protect themselves and their property from a climate-related event. Even though hazard events may impact all parts of the City with equal severity, individuals may experience the effects differently.

Social Vulnerability

Social Vulnerability is broadly defined as the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. Social Vulnerability considers the social, economic, demographic, and housing characteristics of a community that influence its ability to prepare for, respond to, cope with, recover from, and adapt to environmental hazards.

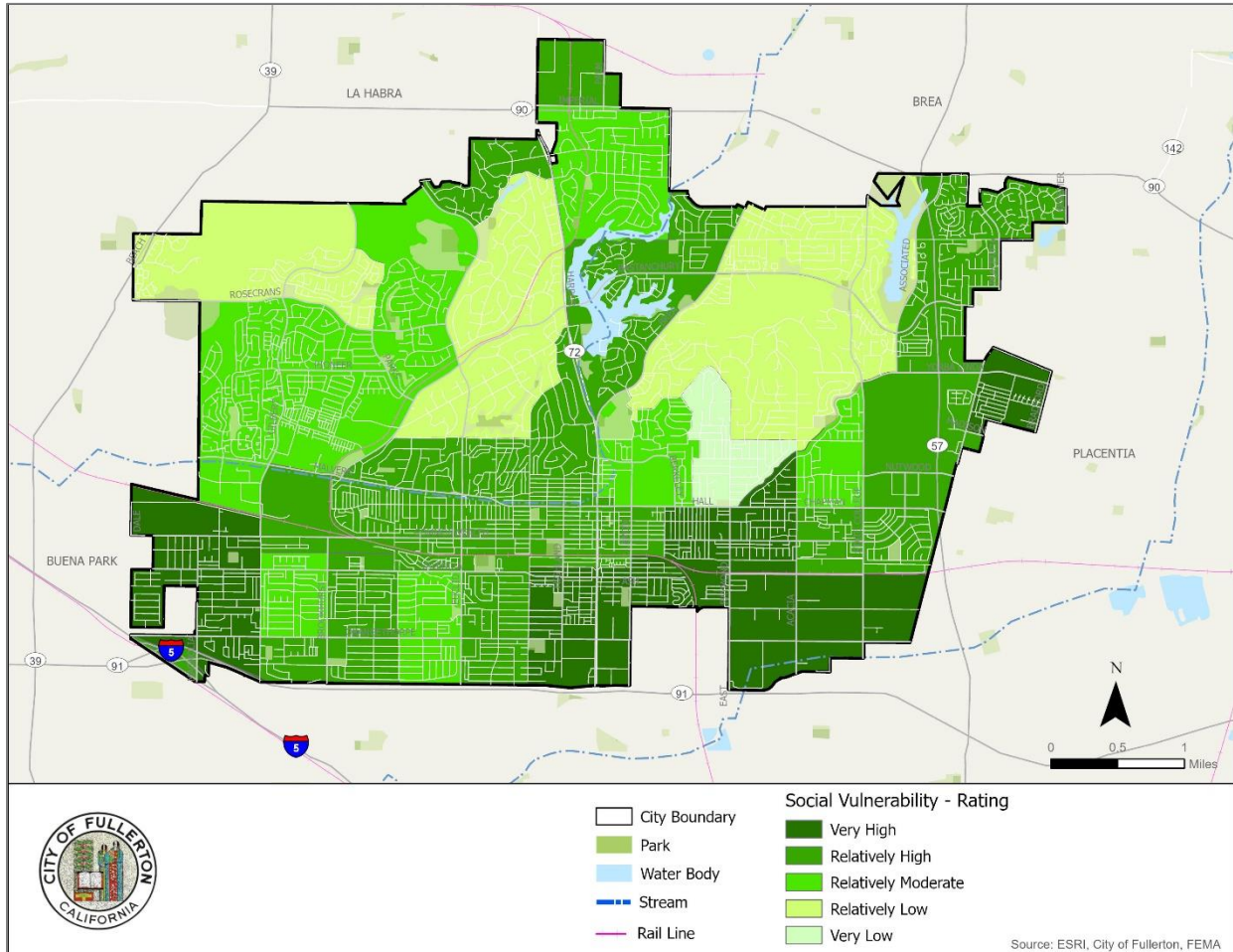
FEMA’s National Risk Index provides Social Vulnerability scores and ratings that represent the relative level of a community’s social vulnerability compared to all other communities at the same level. A community’s Social Vulnerability score measures its national rank or percentile. A higher Social Vulnerability score results in a higher Risk Index score as shown in **Figure 2-4: National Risk Index: Social Vulnerability**.⁸

⁷ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

⁸ Federal Emergency Management Administration. 2023. National Risk Index. <https://hazards.fema.gov/nri/social-vulnerability>. Accessed April 25, 2023.

Compared to all census tracts in the State, tracts in the southern portions of the City have a higher social vulnerability rating, meaning the population in these areas have higher vulnerability – with a lower ability to adapt and respond to natural hazards.

Figure 2-4: National Risk Index: Social Vulnerability Rating



Unhoused Population

People experiencing homelessness are highly susceptible to impacts from direct and indirect climate effects including extreme heat events, air pollution from wildfires, and precipitation-driven or coastal flooding. Factors contributing to the rise in people experiencing homelessness include the general lack of housing affordable to lower-income people, increases in the number of people whose incomes fall below the poverty level, reductions in public subsidies, the de-institutionalization of those with mental illness, and increasing substance abuse issues. According to the Orange County Point-In-Time Report on Homelessness, in 2022 there were 272 people experiencing sheltered or unsheltered homelessness in the City, with 74.3 percent unsheltered. The City saw a 34.4 percent decrease in unsheltered homelessness between 2019 and 2022. While the data regarding socio-demographics was not parsed out by geography (therefore the information released was not specific to cities), in the region 66.4 percent of unsheltered individuals identified as White and 6.2 percent identified as Black or African American, whereas the City’s general population was 34.5 percent and 2.3 percent, respectively. Of

specific concern to climate vulnerability, 32.2 percent of unsheltered respondents reported having a physical disability and 9.8 percent were ages 62 or older.⁹

The Fullerton Police Department’s Homeless Liaison Officer (HLO) Unit is comprised of multiple officers dedicated to assisting the homeless population in Fullerton. Utilizing partnerships with various organizations including Orange County Mental Health, the HLO Unit’s mission is to provide homeless individuals with opportunities to get off the streets and into permanent housing. Some of the organizations we are partnered with include the Fullerton Navigation Center (run by Illumination Foundation), Placentia Navigation Center (run by PATH), Buena Park Navigation Center (run by Mercy House), and the Anaheim Bridges Shelter (run by Mercy House).¹⁰

In Orange County, homelessness is addressed regionally by the Orange County Continuum of Care (COC), an umbrella organization that brings together government agencies and community-based nonprofit organizations in a coordinated effort to meet the urgent needs of people experiencing homelessness or who are in imminent danger of experiencing homelessness.¹¹

Orange County currently has several existing programs to assist individuals experiencing homelessness. The County also provides interim housing (e.g., including the Yale Navigation Center and Bridges at Kraemer Place), emergency shelters, and transitional housing. Finally, the County addresses homelessness through special initiatives such as CalWORKS, a program to assist families with children who are currently homeless or at risk of homelessness.¹²

2.2 MAJOR COMMUNITY ELEMENTS

The identification of assets potentially affected by climate change related events are as follows:

Essential Services

Fire and Emergency Services

The Fullerton Fire Department is led by the Fire Chief and supported by the Deputy Chief of Operations and Deputy Chief of Administration and Fire Marshal. The operations division includes emergency dispatch, emergency medical services (e.g., firefighter/paramedic program, EMS paramedic training, paramedic subscription program, and ambulance transportation), the Office of Emergency Services, MetroNet Fire, and is responsible for training. The Fire Department has six stations located throughout the city.

⁹ County of Orange. 2022. Point-In-Time Report on Homelessness.

¹⁰ Fullerton, City of. 2023. Homeless Liaison Officer (HLO) Unit.

<https://www.cityoffullerton.com/government/departments/police/police-services/homeless-outreach>. Accessed December 20, 2023.

¹¹ County of Orange. 2023. Continuum of Care. <https://ceo.ocgov.com/care-coordination/homeless-services/2023-continuum-care>. Accessed December 9, 2023.

¹² County of Orange. 2023. Homeless Services. <https://www.ocgov.com/residents/health/homeless-services>. Accessed December 9, 2023.

The Fullerton Fire Department also provides prevention resources (e.g., plan check services and hazardous materials services, weed abatement, and fireworks education) and emergency management services.¹³

Police Services

The Fullerton Police Department (FPD) is led by the Chief of Police and supported by Captains and Area Commanders. FPD has Specialized Units ranging from investigation to gang suppression; traffic enforcement and community relations to engage with the community. With a compliment of approximately 180 employees, 125 sworn and 55 civilian positions, the Fullerton Police Department handles close to 50,000 calls for service annually.¹⁴

Transportation Systems

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 near the southwest city limits. In the event of an emergency, most community members would likely evacuate in either direction along any of these arterial highways. If any of these routes become inaccessible, the other roadways and local streets could easily become congested. Use of the roadway system as evacuation routes will be based on the incident occurring and areas of the city impacted.

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. The Fullerton Municipal Airport serves general aviation aircraft.¹⁵

Lifeline Utility systems

Infrastructure plays a vital role in mitigating the effects of hazard events. When infrastructure fails, it can exacerbate the extent of certain hazards or create complications for rescue workers trying to reach victims. For example, fallen utility poles due to high winds or seismic activity, can obstruct roadways and prevent emergency vehicles from reaching affected areas. Brief descriptions of major infrastructure in the City that may be affected by climate-related hazards are as follows:

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

¹³ Fullerton, City of. 2023. Fire Department. <https://www.cityoffullerton.com/government/departments/fire>. Accessed December 20, 2023.

¹⁴ Fullerton, City of. 2023. Fullerton Police. <https://www.cityoffullerton.com/government/departments/police/about-fpd>. Accessed December 20, 2023.

¹⁵ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

Edison sources electricity from power plants throughout California and neighboring states and delivers it through a network of large-scale power lines and substations. The one registered commercial power plant in the city is the CSUF Trigenation natural gas plant on the CSUF campus. There are also a number of noncommercial plants in Fullerton, including the CSUF State College solar photovoltaic plant, a natural gas plant on the Kimberly-Clark campus in southeastern Fullerton, and a number of small-scale solar panel installations. Fullerton has seven power substations: the Norweld, Gilbert, Sunnyhills, Basta, Fullerton, Paper, and Titans Substations. Southern California Edison operates all of these substations. There are also a number of nearby substations outside the city that are operated by Southern California Edison or by other providers. The major transmission lines in Fullerton run along Walnut Avenue, Orangethorpe Avenue, and Imperial Highway (State Route 90) and connect Fullerton to substations outside of the city. While these are not all of the transmission lines running through the City, these external connections provide Fullerton with some redundancies against power outages in the event that individual power lines are damaged, although damage to a substation or more widespread damage to power lines could result in a greater loss of power.¹⁶

Natural Gas and Oil

Natural gas service 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 Placentia, Anaheim, Brea, and other surrounding communities help to keep the natural gas flowing safely and reliably. Oil pipelines run through the neighboring cities of Buena Park and Brea; however no major transmission lines run through the City. Damage to transmission lines in Fullerton or to facilities in surrounding communities could impact services in Fullerton.¹⁷

Water Supply

Most of Fullerton's water is groundwater supplied by the Orange County Water District; the remaining water is imported from the State Water Project and Colorado River and is supplied to Fullerton through regional agencies. According to Fullerton's 2015 Urban Water Management Plan, the City maintains 15 storage reservoirs with a capacity of 69.5 million gallons. With a daily water demand of 223 gallons per capita per day (GPCD) and using the City's 2015 population of 138,976 people, the City has enough reserves to supply the community's needs for roughly two days. This assumes no restrictions are enacted or that GPCD does not decrease. The City maintains connection to a regional pipeline network that allows it to receive water from other Orange County water suppliers in the event of short-term emergencies. Wastewater service in the community is supplied by the Orange County Sanitation District (OCSD). The City operates miles of sewer lines and pump stations that collect wastewater from buildings and facilities in Fullerton and conveys it to regional wastewater treatment facilities. The nearest wastewater treatment facility is the OCSD Plant in Fountain Valley.¹⁸

Stormwater Management

Orange County manages stormwater through the National Pollutant Discharge Elimination System (NPDES), which in California is overseen by Regional Water Quality Control Boards (RWQCBs). The Santa Ana RWQCB (Region 8) includes the City of Fullerton. The Water Quality Control Plan for the

¹⁶ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

¹⁷ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

¹⁸ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

Santa Ana River Basin (Basin Plan) contains the Region Board's policies for managing the Region's water quality. The Basin Plan includes the water quality standards (water quality objectives, beneficial uses, and anti-degradation policy) for the Region, regionally important water quality management and improvement initiatives, policies and practices for implementing water quality standards, and implementation plans. The Clean Water Act requires review of water quality management plans every three years, and the California Water Code, basin plans are reviewed periodically for areas where improvements or updates are needed.

The Basin Plan for the Santa Ana Region includes the upper and lower Santa Ana River watersheds, the San Jacinto River watershed, and several other small drainage areas. The Santa Ana Region covers parts of southwestern San Bernardino County, western Riverside County, and northwestern Orange County. The Basin Plan establishes water quality standards for the ground and surface waters of the region. The Basin Plan includes an implementation plan describing the actions by the Regional Board and others that are necessary to achieve and maintain the water quality standards.^{19,20}

Hazardous Materials

The threat that hazardous materials pose to human health depends on the type of material, frequency, and duration of exposure, and whether chemicals are inhaled, penetrate skin, or are ingested, among other factors. Exposure to hazardous materials can result in short- or long-term effects, including major damage to organs and systems in the body, or death. Hazardous waste is any material with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous materials can also cause health risks if they contaminate soil, groundwater, and air, potentially posing a threat long after the initial release.

Hazardous materials can cause damage to physical assets in the City if they are released into the environment. Corrosive hazardous materials can damage the exteriors of any buildings or structures designated as a critical facility or facility of concern by the City. Flammable hazardous materials can potentially start fires and may cause any nearby critical facilities to flashover. Sites that are closer to the origin for the release of the hazardous materials are more threatened than those that are farther away.

The Cities of Anaheim and Huntington Beach have entered into a Joint Powers Agreement (JPA) to form the Orange County-City Hazardous Materials Emergency Response Authority (OCCHMERA). Anaheim and Huntington Beach provide 2 hazardous materials response teams, which in turn, provide hazmat emergency service for Subscribing Cities, including Fullerton.²¹

Passage of SB 1082 in 1993 required consolidation of State-mandated hazardous waste and hazardous materials management programs within a single Unified Program, to be administered by a Certified Unified Program Agency (CUPA). These programs are:

- Hazardous Waste Generator Program
- Tiered Permitting Program
- Hazardous Materials Business Plan (HMBP)

¹⁹ County of Orange Public Works. 2023. Regional Stormwater Program. <https://ocerws.ocpublicworks.com/service-areas/oc-environmental-resources/oc-watersheds/regional-stormwater-program>. Accessed December 12, 2023

²⁰ California, State of Water Boards. Santa Ana River Basin Plan. https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan. Accessed December 12, 2023.

²¹ Fullerton, City of. 2023. Orange County-City Hazardous Materials Emergency Response Authority (OCCHMERA). <https://www.cityoffullerton.com/government/departments/fire/prevention/occhmera>. Accessed December 20, 2023.

- Aboveground Storage Tank Program
- Underground Storage Tank Program (UST)
- California Accidental Release Program (CalARP)

County and City Fire Agencies within Orange County have joined in partnership with the CUPA as Participating Agencies (PAs). In most Orange County cities, the Environmental Health Division administers all programs, with the exception of La Habra, Fullerton, Huntington Beach, Orange and Fountain Valley in which case the local Fire Agencies are responsible for the Hazardous Materials and Business Emergency Plan Programs. The Fire Agencies in the cities of Orange and Fullerton also administer the Underground Storage Tank Program and LA County Fire administers the CalARP and HMD/BEP programs for the City of La Habra.²²

Fullerton Adaptive Capacity to Climate-Related Hazards

Fullerton has implemented programs or partnered with external agencies to prepare for, respond to, and help the community recover from human-caused and natural hazards, including those that are climate related. The following programs improve the overall adaptive capacity of the City:

AlertOC

AlertOC is Orange County’s official emergency alert and warning system. Information provided by AlertOC in addition to local, State, and Federal alert and warning systems provides the most up-to-date information on emergencies and disasters happening in Orange County.²³

AB 38 Gov Code 1102.19

As of July 1, 2021, a seller of a property that is in a high or very high fire hazard severity zone as identified by the Director of Forestry and Fire Protection must provide to the buyer documentation stating that the property is in compliance with local vegetation management ordinances.²⁴

Community Emergency Response Team (CERT) Program

In the event of an area wide disaster, critical infrastructure and emergency services will be impacted. The Community Emergency Response Team (CERT) academy trains residents to prepare for and respond to life-threatening events in their community. CERT members can mobilize neighborhood resources, deliver immediate assistance to victims, organize emergency communications and provide support to first responders.²⁵

Fullerton Local Hazard Mitigation Plan (2020)

The 2020 LHMP includes goals to decrease the risks associated with the hazards, including:

- Reduce and isolate threats to public safety and property in Fullerton.
- Maintain government operations and provisions of essential services to residents and stakeholders during and after a hazard event.

²² County of Orange Health Care Agency. CUPA. <https://www.ochealthinfo.com/about-hca/public-health-services/environmental-health-division/hazardous-materials>. Accessed December 20, 2023.

²³ AlertOC. 2023. <https://www.ocgov.com/about-county/emergency>. Accessed December 10, 2023.

²⁴ State of California. 2019. AB38, Wood. Fire safety: low-cost retrofits: regional Capacity review: wildfire mitigation. https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB38. Accessed December 3, 2023.

²⁵ Fullerton, City of. 2023. <https://www.cityoffullerton.com/government/departments/fire/emergency-management/cert> Accessed December 10, 2023.

- Protect the natural environment through responsible stewardship of air, water, and open spaces in Fullerton.
- Promote resiliency and climate action in Fullerton through resilient infrastructure, responsive governance, and vibrant civic participation.
- Partner with surrounding local, regional, state, and federal jurisdictions in hazard mitigation efforts.²⁶

²⁶ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

CHAPTER 3. VULNERABILITY ASSESSMENT

Addressing the widespread impacts of climate change represents a significant challenge for the State. A changing climate presents California with five key climate hazards: (1) higher temperatures and extreme heat events, (2) more severe wildfires, (3) more frequent and intense droughts, (4) flooding due to extreme precipitation events and coastal flooding and erosion from sea-level rise, and (5) increased potential for geologic (landslides) and seismic (earthquake-induced liquefaction) hazards. These hazards will threaten public health, safety, and well-being—including from life-threatening events, damage to public and private property and infrastructure, and impaired natural resources.²⁷

Notable examples of climate impacts in Fullerton and the broader Orange County include:

- Across the region, average maximum temperatures are projected to increase around 4-5 degrees °F by the mid-century, and 5-8 degrees °F by the late century.
- Despite small changes in average precipitation, dry and wet extremes are both expected to increase. By the late-21st century, the wettest day of the year is expected to increase across most of the region, with some locations experiencing 25-30 percent increases under RCP8.5. Increased frequency and severity of atmospheric river events are also projected to occur for this region.
- Projections indicate that wildfire may increase over southern California, but there remains uncertainty in quantifying future changes of burned area over the region.²⁸

Following State guidance, this report provides an assessment of the City’s vulnerabilities to climate change. It identifies and describes the climate hazards and other climate effects that may affect the City in the future. The Vulnerability Assessment follows the process outlined in Phase 2 of APG 2.0 and is composed of the following three steps:

- **Exposure:** The purpose of this step is to characterize the City’s exposure to current and projected climate hazards. Existing hazards that can be worsened by the effects of climate change are identified and described, based on historical data, including the City’s Local Hazard Mitigation Plan (LHMP) adopted in 2020. Climate data are used to develop projections for how existing hazards are expected to change by mid- and late century from future climate change.
- **Sensitivity:** This step will characterize potential future climate impacts to community populations and assets. Using historical data and research from regional and State reports on climate impacts, this step explores how sensitive vulnerable populations and assets may be affected by the projected impacts of climate change hazards.
- **Adaptive Capacity:** The purpose of this step is to characterize the City’s current capability to cope with the projected impacts from climate hazards to vulnerable populations and assets. The adaptive capacity of the City to adapt to each of the identified climate impacts is determined through a review of existing plans and programs.

²⁷ California Legislative Analyst’s Office (LAO). 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. <https://lao.ca.gov/Publications/Report/4575>. Accessed December 1, 2023.

²⁸ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

3.1 EXISTING HAZARDS

Orange County has a history of major hazard events. Presidential disaster declarations are typically issued for hazard events that cause more damage than State and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. The following table illustrates examples of past hazard events:

Table 3-1: FEMA-Declared Disasters in Orange County

Name of Event	FEMA Disaster Number*	Date
<i>Bond Fire</i>	FM-5383	2021
<i>Blue Ridge Fire</i>	FM-5381	2021
<i>Silverado Fire</i>	FM-5830	2021
<i>California Covid-19 Emergency</i>	DR-4482	2020
<i>Wildfires (Holy Fire)</i>	FM-5268	2018
<i>Canyon 2 Fire</i>	DR-4344	2018
<i>Canyon Fire</i>	FM-5213	2017
<i>Severe Winter Storms, Flooding, and Mudslides</i>	DR-4305	2017
<i>Severe Winter Storms, Flooding, And Debris And Mud Flows</i>	DR-1952	2011
<i>Freeway Complex Fire</i>	FM-2792	2008
<i>Wildfires</i>	DR-1810	2008
<i>Santiago Fire</i>	FM-2737	2007
<i>241 Fire</i>	FM-2863	2007
<i>Wildfires, Flooding, Mud Flows, And Debris Flows</i>	DR-1731	2007

* DR = Disaster Declaration; EM = Emergency Declaration; FM = Fire Management; FS = Fire Suppression

Source: FEMA, 2023

3.2 ANALYZING CLIMATE CHANGE

The effects of projected climate change include changes in temperature and precipitation contributing to hazards such as extreme heat events, drought, wildfires (and associated decreases in air quality), flooding associated with large precipitation events, landslides, and coastal flooding and inundation resulting from sea level rise. It is important to note that hazardous events may result from isolated changes, or a combination of changes, in temperature and precipitation.

To assess the potential direct and indirect effects from climate change, APG 2.0 recommends using Cal-Adapt, a global climate simulation model data. Cal-Adapt addresses uncertainty surrounding potential GHG emissions with the use of Representative Concentration Pathways (RCP). The RCPs in this Vulnerability Assessment rely upon two future emissions scenarios: RCP 4.5 and RCP 8.5. RCP 4.5 represents a medium emissions scenario of GHG emissions and assumes emissions will rise, then even out near the middle of the century, and decrease to below 1990 levels by the end of the 21st century.

RCP 8.5 is a high emissions scenario where GHG emissions continue to increase through the end of the 21st century.²⁹

Cal-Adapt also includes ten global climate models, downscaled to local and regional resolution using the Localized Constructed Analogs statistical technique. Four of these models were selected by California’s Climate Action Team Research Working Group as priority models for research contributing to California’s Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:

- A warm/dry simulation (HadGEM2-ES),
- A cooler/wetter simulation (CNRM-CM5),
- An average simulation (CanESM2), and
- A dynamic simulation with greater variability (MIROC5).

3.2.1 IMPACTS OF CLIMATE CHANGE

The projected outcomes of climate change include increases or decreases in temperature and precipitation as they relate to the frequency, duration, and intensity of changes. Combined, these changes in the historical patterns of temperature and precipitation contribute to changes in the frequency, duration, and intensity of climate hazard events such as extreme heat events, drought, wildfires (and associated decreases in air quality), flooding associated with large precipitation events, landslides, and coastal flooding and inundation resulting from sea level rise.

3.2.1.1 CHANGES IN TEMPERATURE

Observations over the past century indicate that temperature has increased across southern California. Based on 1896-2015 temperature records for the California South Coast NOAA Climate Division, which encompasses Orange County, there were significant trends in annual average, maximum, and minimum temperature around 0.16°C per decade.³⁰

According to Cal-Adapt, the historic, observed annual average maximum temperature (1961-1990) for the City was 76.4°F, and the historic, observed annual average minimum temperature was 52.3°F.³¹ As shown in **Table 3-2: Projected Change in Annual Average Temperature: City of Fullerton**, both are projected to increase by mid-century and further increase by the end of the century.

The increase in minimum temperatures over time should also be considered as it can have a substantial impact on the community and the economy. Higher minimum temperatures equate to warmer nights that may impact those susceptible to heat effects.

²⁹ Bedsworth et al. 2018. Statewide Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-013.

³⁰ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

³¹ California Energy Commission. 2023. CalAdapt. Local Climate Change Snapshot for Fullerton: Annual Average Maximum and Minimum Temperature. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed November 19, 2023.

Table 3-2: Projected Change in Annual Average Temperature: City of Fullerton

Annual Average Temperature	Historic Annual Average Temperature (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
Maximum	76.4°F	80.4°F	81.5°F	81.3°F	84.5°F
Minimum	52.3°F	55.9°F	57.0°F	56.9°F	60.1°F
°F = degrees Fahrenheit					

California Energy Commission. 2023. CalAdapt. Local Climate Change Snapshot for City of Fullerton: Annual Average Maximum and Minimum Temperature. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed November 1, 2023.

3.2.1.2 CHANGES IN PRECIPITATION

Precipitation over the region is highly variable from year to year and only about five storms each year make up 50 percent of the annual precipitation total. Natural climate variability phenomena, such as the El Niño-Southern Oscillation, can influence the amount of precipitation that the region receives, but there are no clear trends in historical precipitation for this region. Despite small changes in average precipitation, dry and wet extremes are both expected to increase in the future. By the late-21st century, the wettest day of the year is expected to increase across most of the region, with some locations experiencing 25-30 percent increases under RCP8.5. Extreme precipitation often arrives via “atmospheric rivers,” and possible changes to these and other extreme storms are discussed further in the subsequent section. Extremely dry years are also projected to increase over southern California, potentially a doubling or more in frequency by the late-21st century.³²

Annual Average Precipitation Levels

According to Cal-Adapt, annual projected precipitation levels in the City are expected to experience minimal to no change by the end of the century. **Table 3-3: Projected Change in Annual Average Precipitation: City of Fullerton** identifies estimated annual average precipitation levels. The results of these projections suggest that during average years at mid-century, precipitation levels will be similar to conditions currently experienced within the City, with a potential increase in average annual rain at the end of the century under the RCP 8.5 scenario.

Table 3-3: Projected Change in Annual Average Precipitation: City of Fullerton

Average Annual Precipitation	Historic Annual Average Precipitation (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	13.6 Inches	13.2 Inches	13.6 Inches	13.3 Inches	13.2 Inches

CalAdapt. Local Climate Change Snapshot for Fullerton: Annual Average Precipitation. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed November 1, 2023.

This Vulnerability Assessment addresses relevant natural hazards for the City influenced by a changing climate and includes Extreme heat events, drought, wildfire and smoke, flooding, landslides and liquefaction. Swings in extreme weather, such as extremely dry and hot conditions followed by extremely wet conditions and back again, can also exacerbate wildfires and flooding for certain land uses.

³² Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

Mental Health

The impacts from climate change such as fires and floods can have acute mental health impacts. As reported in the State’s 4th Climate Change Assessment, there are potential links between extreme weather events and anxiety and depression, post-traumatic stress disorder, and suicide.³³

3.2.1.3 EXTREME HEAT EVENTS

Extreme heat events are a period when temperatures are abnormally high relative to a designated location’s normal temperature range. Extreme heat events are one of the leading weather-related causes of death in the United States from 1999 through 2009, extreme heat exposure caused more than 7,800 deaths.³⁴ There are generally three types of extreme heat events:

- Extreme Heat Days: a day during which the maximum temperature surpasses 98 percent of all historic high temperatures for the area, using the time between April and October from 1961 to 1990 as the baseline.
- Warm Nights: a day between April and October when the minimum temperature exceeds 98 percent of all historic minimum daytime temperatures observed between 1961 and 1990.
- Extreme Heatwaves: a successive series of extreme heat days and warm nights where extreme temperatures do not abate. While no universally accepted minimum length of time for a heatwave event exists, Cal-Adapt considers 4 successive extreme heat days and warm nights to be the minimum threshold for an extreme heatwave.

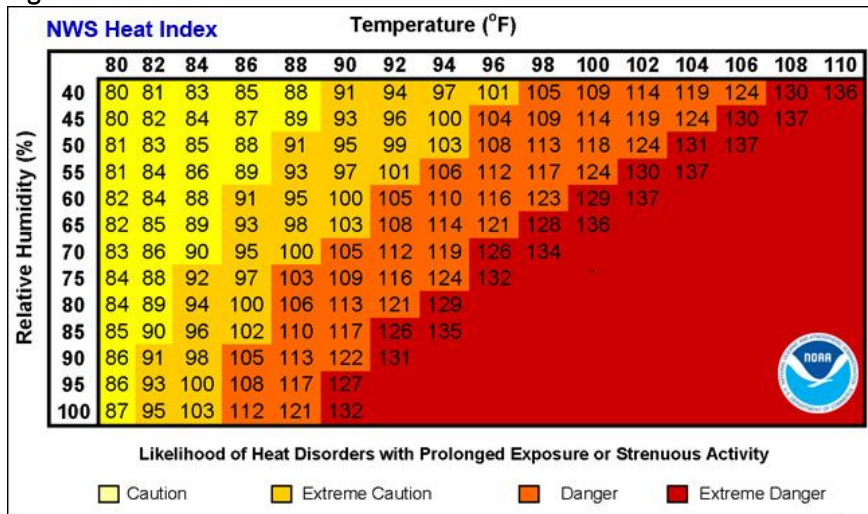
Extreme heat events will feel different from region to region since different areas have different historic high temperatures. For example, an extreme heat day on the coast will feel different than an extreme heat day in the high desert. This is because humidity plays a factor in the perceived heat that people feel. Humid conditions will make a day feel hotter than non-humid conditions, even though the temperature may be the same. The difference between the perceived temperature and the actual temperature is known as the “heat index.” To illustrate the effect of the heat index, a 90°F day with 50 percent humidity feels like 95°F, whereas a 90°F day with 90 percent humidity feels like 122°F. **Figure 3-1: National Weather Service Heat Index** shows the National Oceanic and Atmospheric Administration (NOAA)’s National Weather Service (NWS) Heat Index.³⁵

³³ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

³⁴ United States Global Change Research Program, 2016: The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. A. Crimmins, J. Balbus, J. L. Gamble, C. B. Beard, J. E. Bell, D. Dodgen, R. J. Eisen, N. Fann, M. D. Hawkins, S. C. Herring, L. Jantarasami, D. M. Mills, S. Saha, M. C. Sarofim, J. Trtanj, and L. Ziska, Eds.

³⁵ National Oceanic and Atmospheric Administration (NOAA)’s National Weather Service Heat Index. <https://www.weather.gov/safety/heat-index>. Accessed November 30, 2023.

Figure 3-1: National Weather Service Heat Index



Source: National Oceanic and Atmospheric Administration National Weather Service Heat Index.

Historical Extreme Heat Events

Local data for Fullerton is generally available using the National Weather Service Cooperative Network station at Fullerton Municipal Airport. The data indicates that the average maximum temperature for the area from all years between 1991 and 2020 is 86.7°F, occurring in the month of August.³⁶

Significant historic extreme heat events include:

- October 24, 2017. Daily temperature records were set for all weather monitoring stations in the Orange County including Fullerton at 107°F.³⁷
- September 22, 2021. A heatwave across California set records including temperatures reaching 105°F in Orange County³⁸.
- September 22, 2022. A heatwave across California set records including temperatures reaching 110°F in Fullerton³⁹.
- August 27, 2023. South California reached 100°F plus degrees including areas of inland Orange County.⁴⁰

Unusually hot days and multi-day heatwaves are a natural part of day-to-day variation in weather. As the Earth’s climate warms, however, hotter-than-usual days and nights are becoming more common, and heatwaves are expected to become more frequent and intense. Increases in these extreme heat events can lead to more heat-related illnesses and deaths, especially if people and communities do not take steps to adapt.⁴¹

³⁶ Western Regional Climate Center. 2023. Fullerton Municipal Airport, California. <https://wrcc.dri.edu>. Accessed December 8, 2023.

³⁷ Henson, Bob. 2017. Record-melting Fall Heat Wave Bakes Southern California. www.wunderground.com. Accessed December 1, 2023.

³⁸ Los Angeles Daily News. Triple-Digit Heat Wave Continues in Southern California. Accessed December 1, 2023.

³⁹ Daily Titan. Heat waves: What students should know. Accessed December 1, 2023.

⁴⁰ Darwish, Mona. 2023. Heat Wave Blasts Southern California. Los Angeles Times. August 27.

⁴¹ Sarofim, M.C., S. Saha, M.D. Hawkins, D.M. Mills, J. Hess, R. Horton, P. Kinney, J. Schwartz, and A. St. Juliana. 2016. Chapter 2: Temperature-related death and illness. In: The impacts of climate change on human health in the United States: A scientific assessment. U.S. Global Change Research Program.

VULNERABILITY TO EXTREME HEAT EVENTS

Exposure

More frequent, larger magnitude, and longer duration heatwaves are already emerging as an important aspect of climate change in the Orange County.⁴²

Annual mean maximum temperature could increase by 4.1°F by 2100 (see **Table 3-2: Projected Change in Annual Average Temperature: City of Fullerton**).⁴³ As illustrated in **Table 3-4: Projected Change in Number of Extreme Heat Days: City of Fullerton (98.6°F)** the annual number of extreme heat days (over 98.6°F, the 98th percentile) in the City could increase up to 17 days by 2100 under the high emissions scenario.⁴⁴

Table 3-4: Projected Change in Number of Extreme Heat Days: City of Fullerton (98.6°F)

Number of Extreme Heat Days*	Historic Annual Average Extreme Heat Days (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	2	10	13	12	27
*Number of days in a year when daily maximum temperature is above a threshold temperature of 98.6 °F. Note: Threshold temperature used in this tool is location specific. It is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at a location.					

However, when evaluating temperatures 85°F and above, the annual number of extreme heat days in the City could double by mid-century under the medium emissions scenario and more by end of century under the high emissions scenario. **Table 3-5: Projected Change in Number of Extreme Heat Days: City of Fullerton (85°F)**

Table 3-5: Projected Change in Number of Extreme Heat Days: City of Fullerton (85°F)

Number of Extreme Heat Days*	Historic Annual Average Extreme Heat Days (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	71	128	149	142	183
*Number of days in a year when daily maximum temperature is above a threshold temperature of 85 °F. Note: Threshold temperature used in this tool is location specific.					

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Fullerton: Extreme Heat Days. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed December 1, 2023.

42 Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

43California Energy Commission. 2022. CalAdapt. Local Climate Change Snapshot for Fullerton: Annual Average Maximum Temperature. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed December 1, 2023.

44California Energy Commission. 2022. CalAdapt. Local Climate Change Snapshot for Fullerton: Extreme Heat Days. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed December 1, 2023.

Warm Nights

Warm night temperatures affect the ability of a community and its residents to effectively cool down from extreme heat days. If temperatures remain higher than normal during the night, the compounding impacts from high daytime temperatures can be highly detrimental to public health.

According to Cal-Adapt, a warm night event in the City is a night when the evening temperature exceeds 67.9°F. **Table 3-6: Projected Change in Number of Warm Nights: City of Fullerton** identifies the projected average number of warm nights that would occur each year under the RCP 4.5 and RCP 8.5 scenarios. By 2100, an average of 75 warm nights (RCP 8.5) could be experienced compared to current conditions of 7 days annually based on observed historical conditions. Based on these projections, the City can anticipate increased demand towards the end of the century - for overnight cooling centers and calls for service from vulnerable populations, which are expected to be disproportionately impacted by extreme heat conditions.

Table 3-6: Projected Change in Number of Warm Nights: City of Fullerton

Average Annual Number of Warm Nights*	Historic Annual Average Warm Nights (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	7	26	37	35	75
*Number of days in a year when daily minimum temperature is above a threshold temperature of 67.9 °F. Note: Threshold temperature used in this tool is location specific. It is defined as the 98th percentile value of historical daily maximum/minimum temperatures (from 1961–1990, between April and October) observed at a location.					

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Fullerton: Warm Nights. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed November 1, 2023.

Sensitivity: Major Community Elements

The impacts of extreme heat events will be most severely felt in highly developed areas of the City that are intensely paved and surrounded by buildings constructed of dark (heat absorbing) materials without the cooling benefits of tree shade. Compared with rural communities, urbanized areas can experience higher temperatures, greater pollution, and more negative health effects, especially during summer months. This phenomenon is known as the Urban Heat Island Effect (UHIE). Urban heat islands are created by a combination of heat-absorptive surfaces (e.g., dark pavement and roofing), heat-generating activities (e.g., automobile engines and industrial generators), and the absence of “green spaces” (vegetative surfaces that provide evaporative cooling). During extreme heat days and heatwaves, asphalt and darker surfaces reduce nighttime cooling as these surface types retain more heat to be released at night. The UHIE is known to intensify extreme heat days and heatwaves.

Transportation Systems

High temperatures increase the risk of pavement deterioration, depending on the paving materials and the traffic load of a given road.^{45,46} The type of pavement used is typically based on historical

⁴⁵ Daniel, J.S., J.M. Jacobs, E. Douglas, R.B. Mallick, and K. Hayhoe. 2014. Impact of climate change on pavement performance: Preliminary lessons learned through the Infrastructure and Climate Network (IC Net). doi:10.1061/9780784413326.001.

⁴⁶ Rowan, E., C. Evans, M. Riley-Gilbert, R. Hyman, R. Kafalenos, B. Beucler, B. Rodehorst, A. Choate, and P. Schultz. 2013. Assessing the sensitivity of transportation assets to extreme weather events and climate change. Transportation Research Record: Journal of the Transportation Research Board 2326(1):16—23. doi:10.3141/2326-03.

climate conditions; the increasing occurrence of frequent and prolonged extreme heat outside of historical norms will present challenges to the roadway system.⁴⁷ Extreme heat may also cause pavement heave and damage to transportation infrastructure and functioning.⁴⁸ Extreme heat is also problematic for rail systems, as railroad tracks exposed to high temperatures are at risk of warping or buckling.⁴⁹

Lifeline Utility Systems

As heatwaves worsen, energy systems will need to adapt to help communities cope with rising temperatures. Access to air conditioning will be vital for vulnerable populations, even life saving for the elderly, young children, and those with pre-existing health conditions. However, increased cooling needs for both air conditioning and refrigeration will place significant stress on the power system during periods of extreme heat. And if that power comes from fossil fuel-fired power plants, there may also be an increase in soot, smog, and other forms of air pollution with associated public health consequences.⁵⁰ Impacts on electricity resources from climate hazards can include stress and physical damage to the electricity generation, transmission, and distribution system.

Transmission facilities face increasing climate change-related risks because of increased frequency of wildfires, severe wind, and extreme heat. Extreme heat and drought can add stress to transmission systems, resulting in system failure. Electrical infrastructure may fail due to increased electrical loads and stress from longer periods of increased operation. A 2011 study found that just one extra day with temperatures above 90°F increases annual household energy use by 0.4 percent.⁵¹

Higher temperatures can reduce the water supply in California from reduced precipitation and snowpack and earlier snowmelt.⁵²

Renewable energy and electricity storage technologies can add flexibility to the electricity grid. Together with microgrids, renewables can support increased grid resilience and reliability in the face of extreme weather. Electricity storage also has the potential to replace fossil fuel-fired "peaking" power plants, which are called upon in times of high demand for electricity such as during extreme heat events.⁵³

⁴⁷ Holsinger, H. 2017. Preparing for change. FITWA-HRT-17-002. Public Roads 80(4). McLean, VA: Office of Research, Development, and Technology, Federal High Administration. <https://highways.dot.gov/public-roads/januaryfebruary-2017/preparing-change>. Accessed November 11, 2022.

⁴⁸ Guo Y, Gasparrini A, Li S, Sera F, Vicedo-Cabrera AM, de Sousa Zanotti Stagliorio Coelho M, et al. (2018) Quantifying excess deaths related to heatwaves under climate change scenarios: A multicountry time series modelling study. *PLoS Med* 15(7): e1002629.

⁴⁹ Magill, B. 2014. "Sun kinks" in railways join the list of climate change's toll. *Scientific American*, June 2. www.scientificamerican.com/article/sun-links-in-railways-join-the-list-of-climate-change-s-toll. Accessed November 11, 2022.

⁵⁰ Abel, D.W., T. Holloway, M. Harkey, P. Meter, D. Ahl, V.S. Limaye, and J.A. Patz. 2018. Air-quality-related health impacts from climate change and from adaptation of cooling demand for buildings in the eastern United States: An interdisciplinary modeling study. *PLOS Medicine* 15(7):1—27. doi:10.1371/journal.pmed.1002599.

⁵¹ Deschênes, Olivier and Michael Greenstone. 2011. Climate Change, Mortality, and Adaptation: Evidence from Annual Fluctuations in Weather in the US. *American Economic Journal: Applied Economics* Vol. 3 No. 4 October 2011

⁵² U.S. Environmental Protection Agency. 2016. What Climate Change Means for California. <https://www.epa.gov/sites/production/files/2016-09/documents/climate-change-ca.pdf>

⁵³ Abel, D.W., T. Holloway, M. Harkey, P. Meter, D. Ahl, V.S. Limaye, and J.A. Patz. 2018. Air-quality-related health impacts from climate change and from adaptation of cooling demand for buildings in the eastern United States: An interdisciplinary modeling study. *PLOS Medicine* 15(7):1—27. doi:10.1371/journal.pmed.1002599.

Economic Elements

Laborers in weather-exposed industries such as construction and agriculture are the most prone to extreme heat impacts, even if they work fewer hours when it is hotter. Workers are less productive when it is hotter out.⁵⁴ Exposure to high temperatures may affect worker safety by increasing rates of workplace injuries⁵⁵ and it may also affect the performance and productivity of workers.⁵⁶ Higher temperatures tend to reduce growth in many industries that involve substantial indoor work, including retail, services, and finance. A 1°F increase in the average summer temperature is associated with a reduction in the annual growth rate of state-level economic output of 0.15 to 0.25 percentage points, and rising temperatures could reduce U.S. economic growth by up to one-third over the next century.⁵⁷

The increase in electricity usage on hot days stresses electric grids right when people depend on them most, as seen in California during recent heatwaves. Blackouts can be quite costly for the economy, as inventories of food and other goods can be spoiled, and many businesses either must run generators or shut down. For instance, the 2019 California blackouts cost an estimated \$10 billion due to business closures.⁵⁸

Natural Resource Areas

Extreme temperatures — as opposed to warmer average temperatures — are the catalyst for a growing number of extinctions. In 2002, researchers looked at 538 plant and animal species at 581 sites around the world that had been previously surveyed. The goal was to understand what aspects of climate change were the most serious threat to biodiversity. They found that 44 percent of the species at the sites had gone locally extinct, and that the culprit was an increase in the temperature of the hottest days of the year.⁵⁹

Birds suffer more than other animals as they are diurnal (active in the day) and exposed to the hottest part of the day. Small mammals live underground and are generally nocturnal (active at night). A recent study found that the number of areas that native bumblebees occupy has plummeted 46 percent in North America and 17 percent in Europe compared to surveys taken from 1901 to 1974. Those bee-less areas were also places with a high degree of climate variation, especially higher temperatures. The study concluded that climate change—specifically hotter and more frequent extremes in temperatures—is related to the growing risk of extinction that animals are facing around the world.⁶⁰

⁵⁴ Lemione, Derek. 2021. 4 ways extreme heat hurts the economy. Cornell University Alliance for Science. August 3. <https://allianceforscience.cornell.edu/blog/2021/08/4-ways-extreme-heat-hurts-the-economy>. Accessed May 6, 2022.

⁵⁵ Park, J., Pankratz, N., & Behrer, A. (2021). Temperature, Workplace Safety, and Labor Market Inequality. IZA Discussion Paper No. 14560

⁵⁶ Cui, W., Cao, G., Park, J. H., Ouyang, Q., & Zhu, Y. 2013. Influence of indoor air temperature on human thermal comfort, motivation and performance. *Building and environment*, 68, 114-122.

⁵⁷ Colacito, Riccardo; Bridget Hoffmann, Toan Phan. 2018. Temperature and Growth: A Panel Analysis of the United States. *Journal of Money, Credit, and Banking*. December 3. <https://doi.org/10.1111/jmcb.12574>. Accessed May 6, 2022.

⁵⁸ Wara, Michael. 2019. Impacts of Wildfire on Electric Grid Reliability. Senate Energy and Natural Resources Committee Testimony. December 19.

⁵⁹ Roman-Palacios, Cristian and John J Wiens. 2020. Recent responses to climate change reveal the drivers of species extinction and survival. *Proceedings of the National Academy of Sciences*. February 10. <https://doi.org/10.1073/pnas.1913007117>

⁶⁰ Soroye, Peter. Tim Newbold, Jeremy Kerr. 2020. Climate change contributes to widespread declines among bumble bees across continents. *Science*. February 7. Pp. 685-688. DOI: [10.1126/science.aax8591](https://doi.org/10.1126/science.aax8591).

Water stress induced mortality processes such as hydraulic failure or carbon starvation are caused by extreme heat (and drought). Many trees operate at or near their tolerance limit for water stress and may not be able to acclimate to keep pace with the changing climate.⁶¹

Climatic changes alter the range, biogeography, and growth of microbes and the vectors of food, water, and vector-borne illnesses. This includes the changes in aquatic environments that could increase harmful algal blooms and lead to increases in foodborne and waterborne illnesses.⁶²

Sensitivity: Vulnerable Populations

Increased temperatures manifested as heatwaves and sustained high-heat days directly harm human health through heat-related illnesses (mild heat stress to fatal heat stroke) and the exacerbation of pre-existing conditions in the medically fragile, chronically ill, and vulnerable. Increased heat also intensifies the photochemical reactions that produce smog and ground level ozone and fine particulates (PM2.5), which contribute to and exacerbate respiratory disease in children and adults. Increased heat and carbon dioxide enhance the growth of plants that produce pollen, which are associated with allergies.⁶³

Higher temperatures and extreme heat can lead to heat cramps, heat exhaustion, heat stroke, respiratory illness, and increase the risk of heat-related mortality and expansion of vector-borne disease.⁶⁴

Whereas a heat event can be relatively harmless for those with a reliable means of staying hydrated and cool, it can be deadly for others. Young children, the elderly, or people suffering from serious medical conditions are physiologically more vulnerable to heatstroke. Some senior citizens also take medicines that can make it harder for their bodies to maintain a safe internal temperature, creating an additional threat from extreme heat events. Young children may not be aware of the signs of dehydration or ways of protecting themselves from heatstroke.

Extreme heat can cause urban surface areas to become 50 to 90°F Fahrenheit warmer than the air temperature. Extreme heat is present at all hours of the day and the night but is most intense during the day and in the summer. Due to changes in the sun's intensity, its magnitude varies with seasons. Surface heat contributes to human discomfort during the day and an increase in energy demand for air conditioning.⁶⁵

Sudden spikes in heat can catch people by surprise. Stores can rapidly sell out of fans, air-conditioning units, or drinking water during a heatwave. Lower-income households or those with limited mobility may be unable to acquire enough insulation or cooling devices without significant advance preparations. This can be further compounded by the threat of Public Safety Power Shutoff events. During these events, extreme heat impacts may affect larger portions of the City and populations that would not be considered as vulnerable under normal circumstances.

⁶¹ Williams I N, Torn M S, Riley W J and Wehner M F 2014 Impacts of climate extremes on gross primary production under global warming Environ. Res. Lett

⁶² California Department of Public Health. 2017. Climate Change and Health Profile Report Santa Clara County.

⁶³ Maizlish N, English D, Chan J, Dervin K, English P. Climate Change and Health Profile Report: Santa Clara County. Sacramento, CA: Office of Health Equity, California Department of Public Health; 2017.

⁶⁴ Southern California Association of Governments. 2020. Extreme Heat & Public Health Report. September.

⁶⁵ Southern California Association of Governments. 2020. Extreme Heat & Public Health Report. September.

While the general population may be less vulnerable to extreme heat events, people have unique and individual thresholds. Extreme heat events including heatwaves can lead to illness and death, particularly among older adults, the very young, and other vulnerable populations. People experiencing homelessness are at a high risk of health complications during heatwaves, especially if they are unsheltered.

Adaptive Capacity

Current research indicates that most people can adapt biologically and physically to incremental increases in average normal temperatures. Children, pregnant women, and older adults are more susceptible to adverse effects because they are less able to regulate their body temperatures. Other at-risk groups include individuals working outdoors, the socially isolated, and those with incomes below the federal poverty level, as well as communities of color. Continuous exposure to increased heat over time will impact how individuals are able to work and play both now and in the future.⁶⁶

Regulation and Planning

Fullerton has addressed extreme heat in planning and research documents such as the Local Hazard Mitigation Plan, including a mitigation action to “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 potentially change as a result of climate change.

State of California: HeatReadyCA

The State of California provides resources and information to help you stay safe, cool and connected include developing a plan, understand warning signs, and provide cooling center location services.⁶⁷

City of Fullerton: Heat Awareness and Cooling Center Information

Fullerton also provides Heat Awareness and Cooling Center Information that provides the protocol for three stages of readiness actions that include a Readiness Phase - Heat Advisory, Heat Alert Phase – Excessive Heat Watch, and Heat Alert Phase – Excessive Heat Warning. The protocols provide direction as to when the Heat Advisory or Heat Alerts are issued following a set criteria and use of standard indices and include the necessary actions such as monitoring, communication, and notifications.

Cooling Centers

To provide respite from extreme heat, Fullerton provides two cooling centers at the Fullerton Community Center at 340 W. Commonwealth and the Fullerton Main Library at 353 Commonwealth Avenue. There are also cooling centers located throughout the region to support vulnerable individuals and families.⁶⁸

Aging Adults Excessive Heat Resources

The Orange County Office of Aging provides excessive heat resources to older adults and persons with health problems to stay safe during extreme heat.⁶⁹

⁶⁶ National Institute of Health, National Institute of Environmental Health Sciences. 2022. *Temperature-related Death and Illness*. https://www.niehs.nih.gov/research/programs/climatechange/health_impacts/heat/index.cfm#footnote1 Accessed April 7, 2022.

⁶⁷ State of California. Office of Community Partnerships and Strategic Communications. 2023. Heat Ready California. Accessed December 21, 2023.

⁶⁸ County of Orange. 2023. Cooling Centers. <https://ocgov.com/cooling-centers>. Accessed December 21, 2023.

⁶⁹ County of Orange. 2023. Excessive Heat. <https://www.officeonaging.ocgov.com/resources/excessive-heat>. Accessed December 21, 2023.

3.2.1.4 DROUGHT + WATER SUPPLY

Increasing temperatures and changes in precipitation may lead to intensified drought conditions. Warmer temperatures contribute to more frequent and intense droughts by leading to a decline in and faster melting of winter snowpack, greater rates of evaporation, and drier soils. These conditions decrease the amount of spring and early summer snowmelt runoff upon which the State historically has depended for its annual water supply, while they increase the demand for irrigation water in both agricultural and urban settings. The period of 2012 through 2015 represents the State's four driest consecutive years on record in terms of Statewide precipitation, and 2021 was the third-driest single year.

Drought may lead to water-related problems. When rainfall is less than normal for weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth of water in wells increases. If dry weather persists and water-supply problems develop, the dry period can become a drought.⁷⁰

As a result, droughts have widespread impacts across the State, including mandatory water use restrictions, reductions in agricultural crop production, and over-pumping of groundwater, which damages infrastructure from land sinking and dries up and degrades domestic well habitats.⁷¹

Historical Drought Events

- The 2007–2011 California drought marked the beginning of increased restrictions on State Water Project (SWP) pumping from the Bay-Delta due to environmental considerations. In April 2007, Metropolitan Water District of Southern California (MWD) announced that it would implement shortage-related actions consistent with its Water Surplus and Drought Management Plan (WSDMP).
- In January 2014, Governor Brown proclaimed a state of emergency throughout California, calling for increased conservation across the State. In response to the Governor's drought declaration and call for conservation, the Water Authority activated its WSDMP for the second time since its adoption in 2006, declaring in February 2014 a regional drought response Stage I, Voluntary Supply Management. On April 2, 2017, Governor Brown lifted the drought emergency.⁷²
- On April 21, May 10, and July 8, 2021, Governor Newsom issued proclamations that a state of emergency exists in a total of 50 counties due to severe drought conditions and directed State agencies to take immediate action to preserve critical water supplies, mitigate the effects of drought, and ensure the protection of health, safety, and the environment. On October 19, 2021, Governor Newsom signed a proclamation extending the drought emergency Statewide and further urging Californians to reduce their water use.
- On January 4, 2022, the State Water Resources Board passed Resolution No. 2022-0002 adopting an emergency regulation to supplement voluntary water conservation.⁷³

⁷⁰ United States Geological Survey. 2022. California Water Sciences Center. California Drought. <https://ca.water.usgs.gov/california-drought/what-is-drought.html>. Accessed December 12, 2023.

⁷¹ State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. <https://lao.ca.gov/Publications/Report/4575>. Accessed December 11, 2023.

⁷² United States Geological Survey. 2022. California Water Sciences Center. California Drought. Comparisons. 2012-2016 California Drought: Historical Perspectives. <https://ca.water.usgs.gov/california-drought/california-drought-comparisons.html>. Accessed December 13, 2023.

⁷³ California Department of Water Resources. 2022. Resolution no. 2022-0002 to adopt an emergency regulation to supplement voluntary water conservation. January 4.

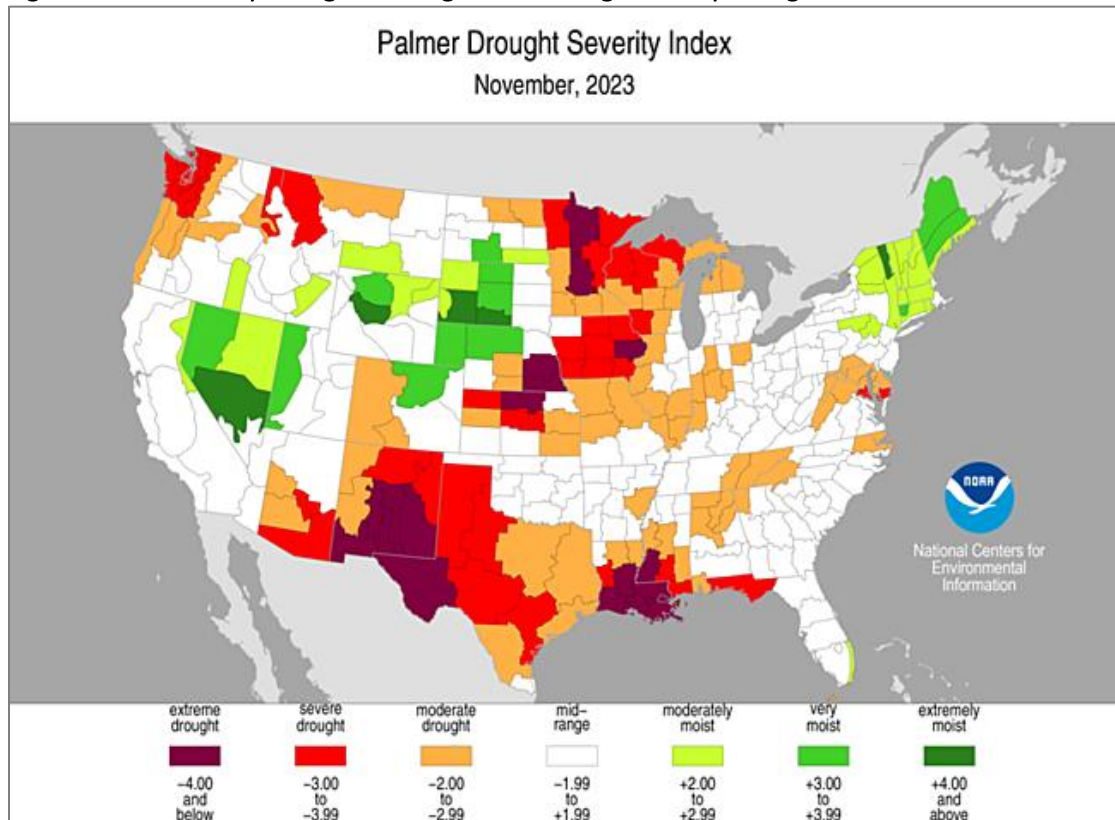
- Excessive rainfall and flooding in late December 2022 and early January 2023 alleviated some of the drought conditions. Governor Newsom officially eased drought restrictions in March 2023. As of November 2023, the City was not considered to be in a state of drought.⁷⁴

MONITORING DROUGHT

The National Oceanic and Atmospheric Administration (NOAA) has developed several indices to measure drought impacts and severity and to map their extent and locations. The Palmer Drought Index measures the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during a given month depends on current weather plus the cumulative weather of previous months. **Figure 3-2: Palmer Hydrological Drought Index Long-Term Hydrologic Conditions For November 2023** shows this index for November 2023.

As the climate continues to change, many historically dry areas like ours are likely to experience less precipitation and increased risk of prolonged droughts, erratic and unseasonal rainfall patterns, flash floods and surface runoff, topsoil erosion, decline in forest canopy, depletion of groundwater supplies, land subsidence, increased dependence on expensive imported water supplies, and subsequent impacts on human health, economy and more. Droughts are among the most expensive weather-related disasters in the world, affecting ecosystems, agriculture, and human society.

Figure 3-2: Palmer Hydrological Drought Index Long-Term Hydrologic Conditions For November 2023



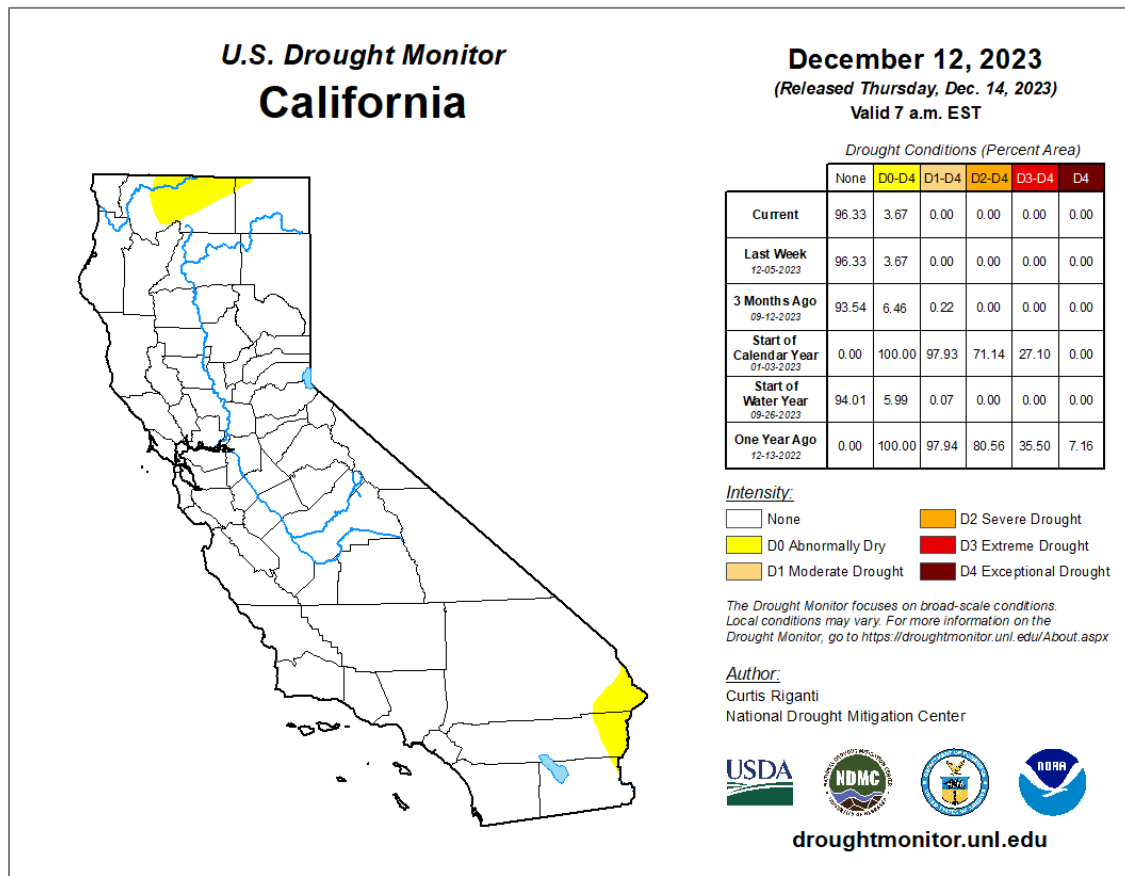
Source: National Oceanic and Atmospheric Administration. Palmer Drought Severity Index. <https://www.ncei.noaa.gov/access/monitoring/historical-palmers/>. Accessed December 14, 2023.

⁷⁴ Office of Governor. 2023. <https://www.gov.ca.gov/2023/03/24/governor-newsom-eases-drought-restrictions/>

The Palmer Drought Severity Index (PDSI) uses monthly temperature and precipitation data to calculate a simple soil water balance. The index is a relative measure that typically ranges from -4 (extremely dry) to +4 (extremely wet) and represents how soil moisture availability differs from that expected for a given place and time of year. The PDSI includes a "memory" component that considers past conditions and persistence of soil moisture surplus or deficit.⁷⁵

While the entire State of California was in severe to extreme drought in the fall of 2022, storms in early 2023 brought much needed precipitation and snowpack that has reduced the impact of the drought. The November 2023 PDSI illustrates the State and Fullerton as having dramatically improved drought conditions with a “mid-range” ranking. The December 12, 2023, Drought Monitor map for California (**Figure 3-3: Drought Monitor**) shows that localized drought conditions as “none” in the City.

Figure 3-3: Drought Monitor



The Drought Monitor is a joint effort of the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center at the University of Nebraska-Lincoln. A map is released each week with drought conditions across the country, indexing everything from groundwater storage to river levels.

Source: National Drought Mitigation Center — University of Nebraska-Lincoln.
<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA>. Accessed December 12, 2023.

⁷⁵ Carolinas Precipitation Patterns & Probabilities. 2023. <https://www.cisa.sc.edu/atlas/glossary.html>. Accessed December 20, 2023.

VULNERABILITY TO DROUGHT

Exposure

As shown **Table 3-3: Change in Annual Average Precipitation: City of Fullerton** under both the medium and high emissions scenarios, the City is not expected to experience significant changes in average precipitation. California, and by extension the City, has been experiencing prolonged periods of drought over the last decade. Recent research suggests that extended drought occurrence (a “mega-drought”) could become more pervasive in future decades. An extended drought scenario is predicted for all of California from 2025 to 2075 under the HadGEM2-ES simulation and high emissions scenario. The extended drought scenario is based on the average annual precipitation between 1961 and 1990 of 13.9 inches. Under the projected drought scenario between 2051 and 2070, Fullerton’s precipitation would decrease by 3.9 inches from the 1961-1990 baseline and the variability in annual precipitation would be between 3.0 and 29.3 inches for the HadGEM 2-ES model.⁷⁶

Drought and Flooding

According to climate forecasters at NASA, the future of fresh water will be full of extremes in the frequency and magnitude of floods and droughts. Droughts will pose serious challenges to the safety, health, and food and water supplies of plants, and animals and humans in some regions. Forecasts must now focus on predicting where it rains, but also how much, and how frequently heavy rain falls versus light rain. Rainfall amount impacts soils saturation and how high streams and rivers rise, which then changes their capacity to hold more in the event of another storm. Drier conditions from extended drought can exacerbate flooding conditions.⁷⁷

Sensitivity: Major Community Elements

Drought will continue to be a foreseeable event in the future of California, including the City of Fullerton. Since most droughts are almost entirely contingent on global weather phenomena, which vary from year to year, it is impossible to predict either the frequency or severity of future drought events in the City. Droughts that result from infrastructure failure are equally impossible to predict since the circumstances that lead to infrastructure failure are unique to each situation.

As vegetation changes because of drought conditions, the animal species that depend on certain plant communities for food supply and habitat may be affected. The projected increase in the duration of droughts through the end of the century may threaten ecosystems as species become weak due to limited access to water and become susceptible to disease, pest, and decay.⁷⁸

An indirect hazard most commonly associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Millions of board feet of timber have been lost, and in many cases, erosion has

⁷⁶ California Energy Commission. Cal-Adapt. 2022. Extended Drought Scenarios, Precipitation by Water Year for Fullerton. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed November 1, 2023.

⁷⁷ National Aeronautics and Space Administration. 2019. Earth's Freshwater Future: Extremes of Flood and Drought. <https://climate.nasa.gov/news/2881/earths-freshwater-future-extremes-of-flood-and-drought/>. Accessed November 1, 2023.

⁷⁸ California Natural Resources Agency, Governor’s Office of Planning and Research, and California Energy Commission. 2019. California’s Fourth Climate Change Assessment; San Diego Region Report. Available: https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-009_SanDiego_ADA.pdf. Accessed December 1, 2023.

occurred, has caused serious damage to aquatic life, irrigation, and power production due to heavy silting of streams, reservoirs, and rivers.

Drought is also often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Pets and farmed animals are also vulnerable to heat-related injuries. Crops, already susceptible from drier conditions, can become even more vulnerable to extreme heat events as well.

Lifeline Utility Systems

Climate change is also expected to increase the average temperature and cause more frequent and prolonged heatwaves in California. During these events, water supplies may be diverted for cooling functions in the City. Hotter temperatures may also lead to increased surface water evaporation which could lead to greater water consumption. If a drought were to occur during a future heatwave, it could place the water supply under strain due to increased consumption potentially in combination with reduced supply.

From a regional perspective, warmer overall temperatures in California are anticipated to lead to a reduction in Statewide water supplies. Much of California's water comes from melted snow in the high sierra. In April 2022, the Sierra snowpack was in decline, at 38 percent of the Statewide average. The snowpack was the lowest it had been since 2015 and registered the sixth lowest April measurement in State history. In January 2023, storms in the Sierra Nevada more than doubled the snowpack for a normal January and surpassed the April annual average.⁷⁹ Water experts from the California Department of Water Resources were reluctant to signal too much optimism given that in the winter of 2021 California snowpacks accumulated to above-average levels through December, only to see January, February, and March of 2022 register as the driest on record.⁸⁰

Economic Elements

Drought causes the most significant economic impacts on industries that use or depend on water for their business — most notably, agriculture and related sectors (forestry, fisheries, and waterborne activities). In addition to losses in crop yields and livestock production, drought is associated with increased insect infestations, plant diseases, and wind erosion. As the general drying of the landscape occurs in a drought, there can be a dramatic shift from high moisture to low moisture, prompting nuisance pests to migrate earlier in the year and in a more concentrated manner.⁸¹ And for certain insects that thrive in warm, dry weather, like grasshoppers, populations increase dramatically. Left unaddressed, grasshoppers could cause agricultural damage so severe that beef and crop prices would go up.⁸² Drought can lead to reduced income for farmers and reduced business for retailers and others who provide goods and services to farmers. This can lead to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue. Prices for food, energy, and other products may also increase as supplies decrease. Additionally, removal of dead trees can be costly and challenging, which can add to the financial impacts of drought.

⁷⁹ California Department of Water Resources. 2023. Snow Water Equivalents. January 20.

⁸⁰ Sternfield, Marc. 2023. California snowpack soars to nearly 200% of normal. KTLA. <https://ktla.com/news/local-news/california-snowpack-200-percent-normal/>. Accessed December 21, 2023.

⁸¹ Schellman, Anne. 2015. California drought may be causing shifts in pest invasion behavior. UC Division of Agriculture and Natural Resources. <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=19008>. Accessed December 21, 2023.

⁸² Brown, Matthew. 2021. Forget cicadas. Drought-stricken West is getting plagued by voracious grasshoppers. Los Angeles Times. June 24.

No structures will be directly affected by drought conditions, though some structures may become vulnerable to wildfires, which are more likely following years of drought. Droughts can also have significant impacts on landscapes, which could cause a financial burden to property owners. However, these impacts are not considered critical in planning for impacts from the drought hazard.

The water sector is central to public health and the economy. Water utilities ensure a reliable supply of clean water to communities and ecosystems and contribute significantly to the resilience of many other sectors, including agriculture, energy, and manufacturing. Drought can result in impacts to water utility operations, including:

- Loss of water pressure and water supply
- Poor water quality that may require additional treatment to meet drinking water standards
- Inability to access alternative and supplementary water sources because of high demand by and competition from other users
- Increased customer demand
- Increased costs and reduced revenues related to responding to drought impacts.

Prolonged droughts could add stress to the City's water supplies, potentially putting more stress on existing groundwater resources within the region. Climate change is projected to cause an increase in the frequency and intensity of extreme precipitation events, which includes droughts as well as intensive flooding. Additionally, hotter temperatures are expected to increase demand for water supply for landscape maintenance in urban areas. Fullerton's natural areas in the Coyote Hills are likely to be at risk of being negatively impacted by more frequent and severe droughts in the future.⁸³

Natural Resource Areas

Climate change threatens biodiversity, as urban development has left species with limited room to migrate. Drier soils may impact the ability of plant species to survive in their native habitats, and riverine ecosystems may experience decreasing populations of aquatic species. Climate change is likely to exacerbate the spread of invasive species and plant diseases that threaten ecosystem health. Aquatic ecosystems may see a decrease in surface water quality, which would place stress on aquatic life and could result in the spread of invasive species. Climate related ecosystem vulnerabilities may lead to habitat fragmentation, which would impede species migration and threaten the connectivity of regional ecosystems.

When a drought occurs, the existing pressures on the ecosystem's natural water supplies are amplified. If the ecosystem's water needs are not considered in water allocation decisions, then this already vulnerable ecosystem may be pushed beyond the threshold at which it can recover. The ecosystem will begin to function differently, leading to a loss in the critical services it once provided humans—such as purifying water and air, preventing erosion, and providing recreation opportunities.⁸⁴ An exceptionally severe drought could dramatically reduce the amount of water available for landscaping in the City and deprive trees of the irrigation they require for their survival.

Lack of moisture, already at a severe level in California due to a current multi-year drought and decades of fuel accumulation from historical forestry and fire suppression practices, increases the risk of wildfires.

⁸³ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

⁸⁴ National Integrated Drought Information Systems. Ecosystems. <https://www.drought.gov/sectors/ecosystems>. Accessed December 5, 2023.

Tree mortality is a key secondary impact of drought. Drought can affect a tree's ability to generate pitch, which it uses to defend itself against infestation by insects such as the bark beetle. Prolonged periods of drought, such as the one just experienced by the State of California, can cause extensive damage to trees. Since May 2016, the U.S. Forest Service has identified 36 million new dead trees, bringing the total estimate of dead trees in California to 62 million. These impacts are not instantaneous, and sometimes are not felt by communities for many years following a drought. Any tree has the potential to be infested by pests that could result in the tree's death. This means all areas of the City that are landscaped with trees could experience tree mortality. These areas include parks, landscaped parkways and street medians, schools, as well as private homes.

Sensitivity: Vulnerable Populations

The entire population of the City is vulnerable to drought. Drought can affect people's health and safety, including health problems related to low water flows, poor water quality, or dust. Droughts can also lead to loss of human life. In addition to fire-related injuries, local and regional transport of smoke, ash, and fine particles increases respiratory and cardiovascular risks. Drought may increase exposure to health hazards including wildfires, dust storms, extreme heat events, flash flooding, degraded water quality, and reduced water quantity. Other possible impacts include recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and hygiene; compromised food and nutrition; and increased incidence of illness and disease.

Adaptive Capacity

Fullerton has addressed drought in planning documents such as their LHMP and the Fullerton Urban Water Management Plan. Orange County has regulations and programs in place that are beneficial during drought events by limiting further potential public health impacts.

Orange County

Orange County Water District

The District manages and protects the Orange County Groundwater Basin (Basin), which provides 85% of the water supply to 2.5 million people in north and central Orange County, including Fullerton. The Basin holds water from a variety of sources, including Santa Ana River flows, stormwater, imported water, and recycled water. They get the remaining 15 percent from imported supplies brought in by the Metropolitan Water District of Southern California (MWD) and served through its local subsidiary member agency, the Municipal Water District of Orange County (MWDOC).

Since the previous drought from 2012-2016, OCWD has worked hard to substantially refill our groundwater basin. At this time, the Basin can provide water for two consecutive years at current pumping levels even if drought conditions persist.

The District has increased water recycling at the Groundwater Replenishment System (GWRS), which produces 130 million gallons of water a day, enough to serve nearly one million people. In early 2023, a final expansion of the facility was completed, recycling 100% of local reclaimable wastewater flows, thereby maximizing water recycling efforts in the region.⁸⁵

Santa Ana Watershed Project Authority

⁸⁵ Orange County Water District. 2023. Drought in California. <https://www.ocwd.com/learning-center/drought/>. Accessed December 21, 2023.

The Santa Ana Watershed Project Authority (SAWPA), of which the District is a member, has launched a weather modification pilot program to increase precipitation through the use of cloud seeding. The process works by releasing particles of silver iodide into clouds, which increases the chances of droplet condensation.⁸⁶

Fullerton

Fullerton 2020 Urban Water Management Plan

This 2020 Urban Water Management Plan (UWMP) provides an assessment of the present and future water supply sources and demands within the City's 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. It also presents a new 2020 Water Shortage Contingency Plan (WSCP) designed to prepare for and respond to water shortages. This 2020 UWMP contains all elements to meet compliance of the new requirements of the UWMP Act of 1983 as amended since 2015.

Fullerton Ordinance No. 3299: Water Supply Shortage Conservation Plan

Establishes water management requirements necessary to conserve water, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, prevent unreasonable use of water, prevent unreasonable method of use of water within the City in order to assure adequate supplies of water to meet the needs of the public and further the public health, safety and welfare, recognizing that water is a scarce natural resource that requires careful management not only in times of drought but at all times.

Establishes six levels of Water Shortage Levels most often triggered due to drought conditions to provide defined response actions to implement during times of declared water shortage or declared water shortage emergency with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

Fullerton Landscape Ordinance 15.50.110

The purpose of the Fullerton Landscape Ordinance is to establish standards for the provision of landscaping within the City of Fullerton while promoting conservation and the efficient use of water, prevention of erosion, protection from fire, and restoration of natural systems.⁸⁷

3.2.1.5 WILDFIRE + SMOKE

According to the State's Fourth Climate Change Assessment, by 2100, the frequency of extreme wildfires burning over 25,000 acres could increase by nearly 50 percent.⁸⁸ As with other climate hazards, the State already is beginning to experience an increase in severe wildfires. Most of California's largest and most destructive wildfires have occurred in recent decades. This pattern has been particularly notable in the last few years, which have seen some of the worst wildfires in the

⁸⁶ Santa Ana Watershed Project Authority. 2023. Weather Modification (Cloud Seeding) in the Santa Ana River Watershed. <https://sawpa.gov/santa-ana-river-watershed-weather-modification>. Accessed December 21, 2023.

⁸⁷ Fullerton Landscape Ordinance. https://codelibrary.amlegal.com/codes/fullerton/latest/fullerton_ca/0-0-0-24090. Accessed December 21, 2023.

⁸⁸ State of California Climate Adaptation Strategy. 2023. <https://climateresilience.ca.gov/overview/impacts.html>. Accessed December 7, 2023.

State's recorded history. Five of the twenty most destructive wildfires in the state's history occurred in 2020 alone, with an additional two in 2021.⁸⁹

Wildfire in southern California is influenced by a multitude of factors: a dry and warm Mediterranean climate with periodic episodes of Santa Ana winds and droughts, the type and spatial distribution of vegetation (along with dead/ dry vegetation caused by pests), varying topography, large urban-wildland interfaces, past fire suppression attempts, and human activities. Hot and dry conditions, combined with offshore winds in autumn create high risk conditions that rapidly spread fires. Fire ignitions in California are primarily due to human activity, and the dry fuels and climate contribute to higher risk of rapid-fire spread. Future projections using statistical models indicate that southern California may experience a larger number of wildfires and burned area by the mid-21st century under RCP8.5. Overall burned area is projected to increase over 60 percent for Santa Ana-based fires and over 75 percent for non-Santa Ana fires.^{90,91}

Not only do high-severity wildfires take lives and level homes, public facilities, and community infrastructure, but they also destroy fish and wildlife habitats. Moreover, intense wildfires can also impair air quality throughout the State.

Historical Wildfire Events

Orange County has experienced large and destructive fires. These include:

- 2007 - The Santiago Fire was a wildfire located near Santiago Canyon where twelve homes were destroyed.
- 2017 - Canyon 2 Fire, was a wildfire that burned in the Anaheim Hills area of the city of Anaheim setting fire to several homes. In total, about 16,570 were ordered to evacuate their homes.
- 2018 - Holy Fire was a wildfire that burned in the Cleveland National Forest in Orange and Riverside Counties, California. The blaze burned 23,136 acres and destroyed 18 buildings.
- 2020 - Bond Fire. A wildfire burned 6,686 acres (2,706 ha) in the Santiago Canyon area of Orange County, California in December 2020. The fire caused evacuations of 25,000 residents and injured 2 firefighters.
- 2020 - The Silverado Fire was a wildfire that burned in October and November 2020 in southern Orange County, California northeast of Irvine.

VULNERABILITY TO WILDFIRE

Climate change will result in changes in precipitation patterns, increased temperature, and drought conditions. Wetter months may lead to increased vegetative growth, while following periods of drought will allow for the vegetative growth to dry up, creating greater amounts of fuel for fires.

⁸⁹ State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. <https://lao.ca.gov/Publications/Report/4575>. Accessed December 11, 2023.

⁹⁰ Ackerly, David, Andrew Jones, Mark Stacey, Bruce Riordan. (University of California, Berkeley). 2018. San Francisco Bay Area Summary Report. California's Fourth Climate Change Assessment. Publication number: CCCA4-SUM-2018-005.

⁹¹ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

Climate change will also worsen existing severe wind events, which fuel the spread and intensity of wildfires.

Exposure

Wildfires begin in natural, undeveloped land. Wildfires sometimes ignite due to natural circumstances, such as intense heat combined with masses of dead vegetation, or lightning strikes. Dry vegetation is highly combustible when the weather is hot and dry. Fires can also ignite under windy conditions from the friction caused by vegetation rubbing together. Humans can also start wildfires, either intentionally or unintentionally. A downed power line in a wind event, for example, could catch the surrounding landscaping or buildings on fire, or an unextinguished cigarette tossed into dry grass may ignite and cause a wildfire. Sometimes humans intentionally burn wild landscapes, often for land management purposes.

Topography can play a role in influencing the speed and direction of a wildfire. Because heat rises, fires move faster uphill, so a steep slope can make a fire spread faster. Thus, fires are a greater risk in mountainous areas.⁹²

Traditionally, fire season in Southern California lasts from May through September. However, over the past 15 years Orange County has experienced some of its most devastating wildfires between October and April [e.g., Santiago Fire and the Freeway Complex Fire.] An analysis of fires with known start dates recorded in the County show:

- Most fires occurred between June and November.
- Approximately 60 percent of all fires were ignited from June through September but accounted for only 26 percent of the area that burned.
- In contrast, 17 percent of all fires occurred in October/November and consumed 61 percent of the land burned between 1940 and 2008.
- Although most ignitions take place between June-September, ignitions in October tend to be larger.⁹³

Wildland Fire vs. Wildland-Urban Interface Fires

Fire science distinguishes between two types of wildfires: “wildland” fires, which burn predominately in undeveloped areas, and “wildland-urban Interface” (WUI) fires. This distinction is important because mitigation, damage, and actions related to the two types may differ significantly.

Wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may be beneficial to the landscape if they burn within the historic range of variability for fire size and intensity. Many species are adapted to California's natural fire regimes and flourish after a low or mixed severity burn. These fires also enhance ecosystem function by creating landscapes that have more variation, are more resilient to other disturbances, and are better able to withstand extremes in precipitation. The wildland fire may result in secondary negative impacts in the form of air pollution, soil erosion (resulting in siltation of streams and lakes), or mudslides, though these impacts tend to be far less than would occur following high severity fires in areas of historic fire suppression. However, unless these fires or their related secondary impacts occur in or near

⁹² Fullerton, City of. Local Hazard Mitigation Plan. 2020.

⁹³ Orange County County-Wide Community Wildfire Protection Plan. 2017.

developed areas they are rarely classified as disasters because they do not affect people or the built environment.

The WUI is characterized by the intersection of the natural and the built environments and has been defined as “the area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels” (Society of American Foresters). The WUI can be configured in many ways including a classic “interface” (e.g., a community that abuts a National Forest at a distinct boundary), an “intermix” (e.g., vegetative fuels distributed between buildings throughout a subdivision between buildings), or an “occlusion” (e.g., a community that completely surrounds a designated open space area).

WUI fires represent an increasingly significant concern for the State of California. California has a chronic and destructive WUI fire history with significant losses of life, structures, infrastructure, agriculture, and businesses. Even relatively small-acreage WUI fires may result in disastrous damage. Most local governments that have submitted Local Hazard Mitigation Plans (LHMPs) have identified fire and WUI fires as specific hazards.⁹⁴

Fire Hazard Severity Zones

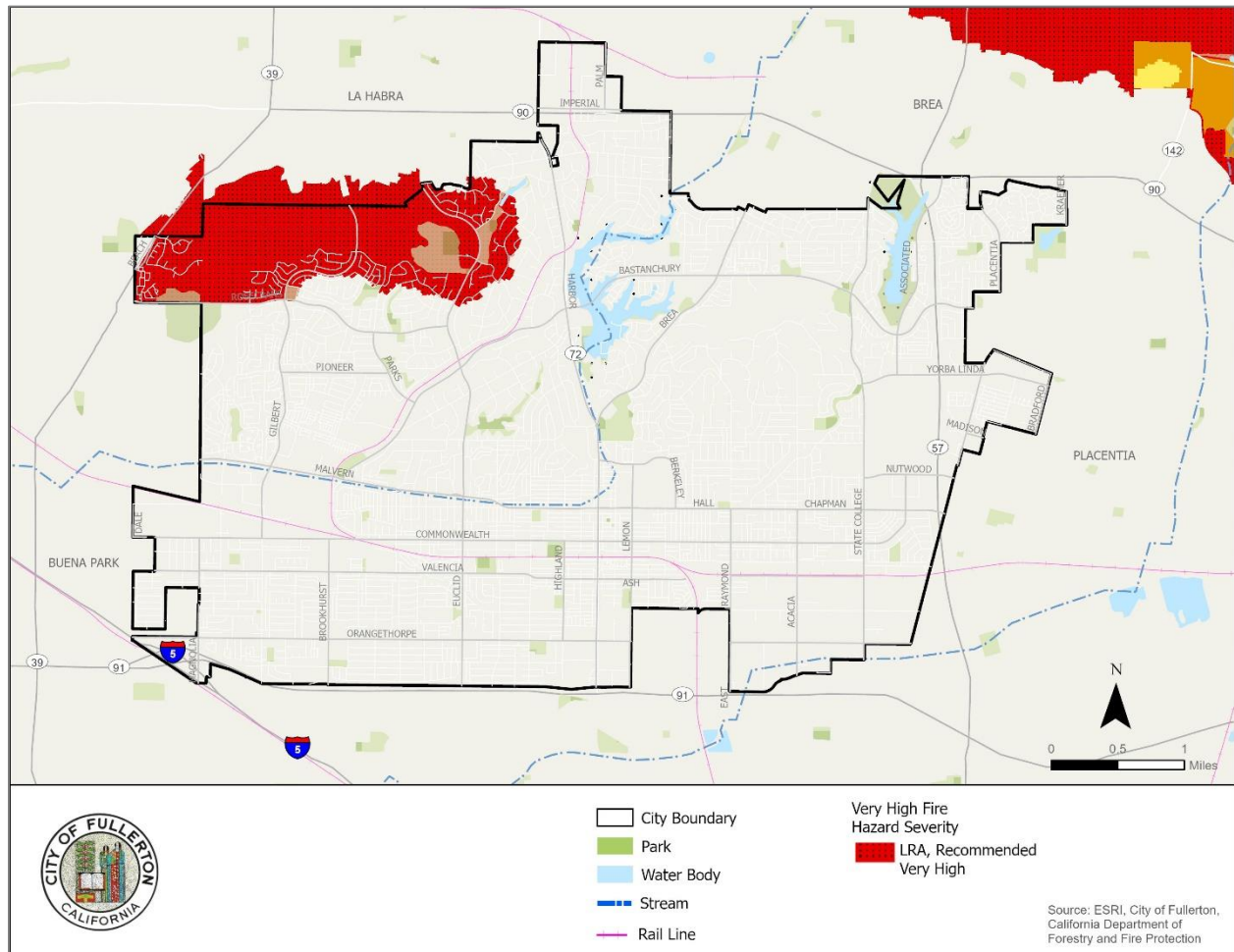
Wildfires are not measured on a specific scale and are usually classified by size (e.g., acres burned) or impact (e.g., buildings destroyed or damaged, injuries or deaths, cost of damage, etc.). The risk of wildfire is classified on a three-tier scale of fire hazard severity zones (FHSZs): very high, high, and moderate. These classes do not correspond to a specific risk or intensity of fire but are qualitative terms that consider many factors. Fire-prone areas are also classified by the agency responsible for fire protection. Federal Responsibility Areas (FRAs) fall to federal agencies such as the US Forest Service, the Bureau of Land Management, and the National Park Service. State Responsibility Areas (SRAs) fall to CAL FIRE, and Local Responsibility Areas (LRAs) fall to local governments.

CAL FIRE data was used to identify Very High Fire Hazard Severity Zones (VHFHSZ) in the City that are included in the LRA (See **Figure 3-4: Fire Hazard Severity Zones**). Development within these zones is regulated through the Uniform Building Code and Uniform Fire Code. State Minimum Fire Safe Regulations apply to all of the SRA (regardless of risk) and local VHFHSZ. Building code requirements apply to all of the WUI, regardless of whether in LRA or SRA. Requirements imposed as part of the development review process include fire lanes, fuel modification zones, fire retardant building materials, smoke detectors and automatic sprinkler systems, depending on the size and type of development.

Climate models have difficulty projecting exactly where and how fires will burn as the frequency, severity and impacts of wildfire are sensitive to climate change as well as other factors, such as development patterns and pest infestations. Instead, climate models estimate increased risk from wildfires. As shown in **Table 3-7: Modeled Annual Area Burned – City of Fullerton**, The amount of area within the City at risk of wildfire is projected to decrease substantially by the end of the century (depending on scenario) compared with the historic baseline.

⁹⁴ California Governor’s Office of Emergency Services. 2023 State Hazard Mitigation Plan.

Figure 3-4: Fire Hazard Severity Zones



Source: Office of the State Fire Marshall. 2023. Fire Hazard Severity Zones (FHSZ). <https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/#explorefhsz>. Accessed November 2023.

Table 3-7: Modeled Annual Area Burned – City of Fullerton

Baseline (hectares) (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
	Mid-Century	End-Century	Mid-Century	End-Century
65.4	14.2	12.7	11.1	11.4

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for City of Fullerton: Wildfire: Modeled Annual Area Burned. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed December 9, 2023.

The Annual Average Area Burned can help inform the City if wildfire activity is likely to increase in the study area. These projections are most robust for the Sierra Nevada given model inputs. Much of California can expect an increased risk of wildfire, with a wildfire season that starts earlier, runs longer, and features more extreme fire events.

Based on the RCP 8.5 scenario, the annual average of area burned is forecast to decrease by over 50 acres by the end of the century. While all of Fullerton is potentially at risk of some type of fire hazard. Since 90 percent of the City’s land is currently built-out, mostly with wooden-frame construction, the potential for wildfires to emerge at any location in the city is more limited.

According to **Table 3-8: Fire Hazard Severity Zone: Vulnerable Populations**, residents living in the VHFHSZ have demographic characteristics dissimilar to the remainder of the City. The median age is 10 years older than in the City as a whole. These are unique challenges for the City, as 33.2 percent of households in the Fire Hazard Severity Zone have at least one individual aged 65 years and older. Additionally, 10.5 percent of households have at least one person living with a disability. Challenges that these populations face include potential inability to access emergency supplies, evacuate, or receive and understand emergency information. The effects of climate change hazards can result in infrastructure disruptions including power outages. Such events could result in additional health hazards for the elderly or persons with disabilities who rely on power to sustain medical equipment or assistive technology.

Table 3-8: Fire Hazard Severity Zone: Vulnerable Populations

	VHFHSZ	City of Fullerton
Total Population ¹	4,458	144,363
Percent of residents who are children (less than 10 years old) ²	7.8%	10.6%
Percent of households that have people 65+ years old ¹	33.2%	28.2%
Percentage of households with at least one person living with a disability ¹	10.5%	21.2%
Median age ²	46.4	36.3
Total households ¹	1,568	48,739
Median household income ²	\$159,104	\$96,047
Percent of rental households ²	24.3%	49.7%
Percent of household income below poverty level ¹	2.2%	11.2%

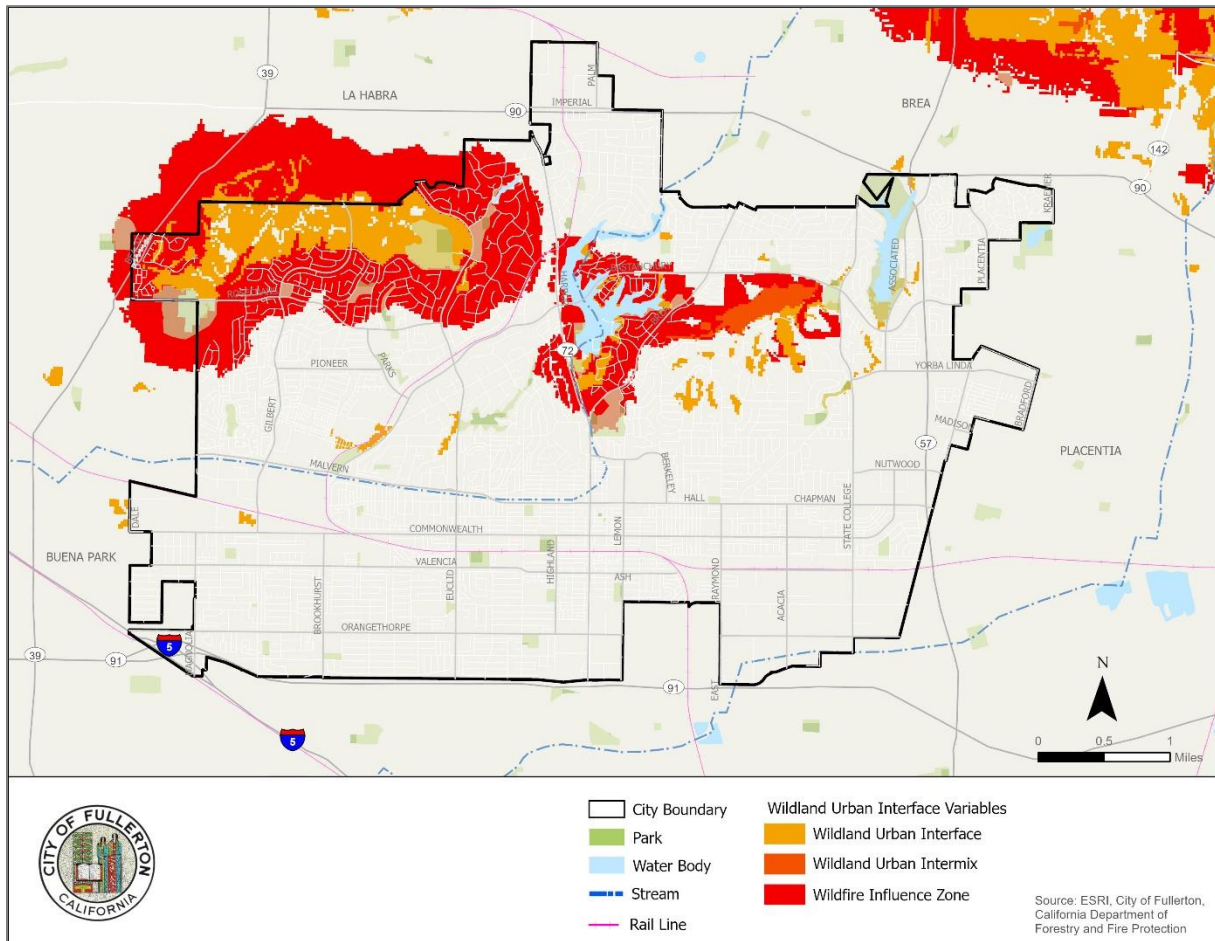
Source: US Census Bureau, ACS 2017 - 2021¹, US Census Bureau 2020 Summary File 1, ESRI Forecasts 2023²

Wildland Urban Interface

This Vulnerability Assessment evaluates housing density and wildfire hazard attributes (FHSZ) in an effort to capture Wildland Urban Interface (WUI). **Figure 3-5: Wildland Urban Interface** displays the overall pattern of WUI development for the City and compares counties in terms of development patterns. Three WUI classes are mapped:

1. Wildland Urban Interface — dense housing adjacent to vegetation that can burn in a wildfire;
2. Wildland Urban Intermix — housing development interspersed in an area dominated by wildland vegetation subject to wildfire; and
3. Wildfire Influence Zone — wildfire susceptible vegetation up to 1.5 miles from Wildland Urban Interface or Wildland Urban Intermix.

Figure 3-5: Wildland Urban Interface



Note: The WUI dataset is not refined through a field review process; it is not suited for WUI designations for individual houses or neighborhoods.

Table 3-9: Wildland Urban Interface: Vulnerable Populations

	WUI	City of Fullerton
Total Population ¹	10,351	144,363
Percent of residents that are children (less than 10 years) ²	7.9%	10.6%
Percent of households that have people 65+ years ¹	45.9%	28.2%
Percentage of households with at least one person living with a disability ¹	20.9%	21.2%
Median age ²	49.6	36.3
Total households ¹	3,651	48,739
Median household income ²	\$152,565	\$96,047
Percent of rental households ²	21.3%	49.7%
Percent of household income below poverty level ¹	2.8%	11.2%

Source: US Census Bureau, ACS 2017 - 2021¹, US Census Bureau 2020 Summary File 1, ESRI Forecasts 2023²

According to **Table 3-9: Wildland Urban Interface: Vulnerable Populations**, residents living in the Wildland Urban Interface have demographic characteristics similar to the Very High Fire Hazard Severity Zones as shown in **Table 3-8: Fire Hazard Severity Zone: Vulnerable Populations**, and therefore the City’s concern would also be similar.

Sensitivity: Major Community Elements

The major fire hazard scenarios of concern to protection agencies are residential fires that start in the home with potential to spread to outlying areas and neighboring structures, and wildfires in natural areas that may pose a threat to life and property. The major limitations upon firefighting capabilities within the rural areas are limited accessibility, long travel distances and response times, and water supply limitations. As described in the 2020 LHMP, there are approximately 44 key facilities located within a Fire Hazard Severity Zone (FHSZ). The majority of these are water pumps or sewage facilities, creating a significant risk to the city’s water infrastructure. Water pumps can fail if they lose power during a fire, hampering firefighting efforts. Additionally, excessive water use from firefighting efforts can lower water pressure in pipes and raise the risk of contamination. Lower water pressure can cause non-potable water to backflow or make it easier for contaminants to be drawn in.

As shown in **Table 3-10: Key Facilities Threatened by Wildfire**, there are a number of medical-related facilities, such as assisted living and nursing facilities, in the wildfire hazard zone. In the event of a wildfire, these facilities may require specialized evacuation to ensure the safety of their occupants due to the high vulnerability of the persons living in these facilities.

Table 3-10: Key Facilities Threatened by Wildfire

Facility Type	Moderate Fire Hazard Severity Zone	High Fire Hazard Severity Zone	Very High Fire Hazard Severity Zone	Total
Emergency Gathering Areas	0	1	1	2
Medical	1	2	2	5
Municipal Government	0	0	1	1
Transportation	2	0	1	3
Water and Sewage	3	4	26	33
Total	6	7	31	44

Source: Fullerton LHMP 2020

Transportation Systems

Wildfire could damage roads in several ways. Unsafe conditions and damage could lead to road closures. Difficulties may arise with simultaneous evacuation and fire response due to roads that are narrow, steep, or have a dead end. Typical asphalt mixtures could ignite or melt/excessively soften. Debris from fires and subsequent landslides could block roads.^{95,96} Most major roads have sidewalks

⁹⁵ Carvel, R., & Torero, J. (2006). The Contribution of Asphalt Road Surfaces to Fire Risk in Tunnel Fires: Preliminary Findings. Proceedings of the International Conference on Risk and Fire Engineering for Tunnels, Stations, and Linked Underground Spaces (pp. 83-87). Hong Kong: Tunnel Management International.

⁹⁶ Cannon, S., & DeGraff, J. (2009). The Increasing Wildfire and Post-Fire Debris-Flow Threat in Western USA, and Implications for Consequences of Climate Change. In K. Sassa, & P. Canuti, Landslides -

that create a small defensible space as well as development of the surrounding areas. Roads can be damaged by increased traffic of heavy vehicles, and vehicles that exceed weight limits, used during emergency response or recovery efforts. Costs associated with transportation infrastructure losses include repair costs, clean-up costs, and costs related to service disruptions.⁹⁷

Lifeline Utility Systems

Additionally, wildfire can cause direct and indirect damage to electrical infrastructure. Direct exposure to fire can sever transmission lines, and heat and smoke can affect transmission capacity. Other impacts of climate change also threaten electricity infrastructure, including wildfires that can destroy poles and towers carrying transmission lines.⁹⁸ Additionally, downed powerlines can cause wildfires.⁹⁹

Wildfire events can physically damage water infrastructure including pipes, water meters, dams, spillways, and other structures and equipment. Costs associated with water infrastructure losses include repair costs, clean-up costs, and costs related to service disruptions. Mitigation actions specifically to reduce water infrastructure losses primarily include infrastructure hardening and defensible space. Water infrastructure damage can also cause contamination of drinking water supplies that can pose a risk to public health.¹⁰⁰ Wildfires can damage or destroy gas, electric, and telecommunications infrastructure including poles, towers, lines, pipes, and other physical assets.¹⁰¹

Economic Elements

Wildfire can lead to the loss of buildings and infrastructure that may need to be repaired from damage or replaced if destroyed. Additional economic losses include the value of private property or inventory that is damaged along with a home, costs associated with temporary accommodation or service disruptions, and costs related to toxic material and debris cleanup. When infrastructure losses cause service disruptions, the costs can be borne by customers and communities far from the perimeter of the wildfire.¹⁰²

Natural Resource Areas

Because of historical forest management trends over the past century, increased temperatures, and more frequent drought, California wildfires are characteristically hotter and more intense as compared to naturally occurring fire regimes. As such, soil structure and moisture retention are damaged,

Disaster Risk Reduction (pp. 177-190). Verlag Berlin Heidelberg: Springer.

⁹⁷ Feo, Teresa J., Amber J. Mace, Sarah E. Brady, and Brie Lindsey. 2020. The Costs of Wildfire in California An Independent Review of Scientific and Technical Information. California Council on Science and Technology. ISBN Number: 978-1-930117-66-2.

⁹⁸ Davis, M., and S. Clemmer. 2014. Power failure: How climate change puts our Electricity at risk—and what we can do. Cambridge, MA: Union of Concerned Scientists. <https://www.ucsusa.org/sites/default/files/2019-10/Power-Failure-How-Climate-Change-Puts-Our-Electricity-at-Risk-and-What-We-Can-Do.pdf>. Accessed December 11, 2023.

⁹⁹ Gonzales, Richard. 2018. PG&E Power Lines Blamed for Northern California Wildfires. National Public Radio. June 8. <https://www.npr.org/2018/06/08/618444388/pg-e-power-lines-blamed-for-northern-california-wildfires>. Accessed December 3, 2023.

¹⁰⁰ Feo, Teresa J., Amber J. Mace, Sarah E. Brady, and Brie Lindsey. 2020. The Costs of Wildfire in California An Independent Review of Scientific and Technical Information. California Council on Science and Technology. ISBN Number: 978-1-930117-66-2.

¹⁰¹ California Governor's Office of Emergency Services (Cal OES) 2018. California State Hazard Mitigation Plan. https://www.caloes.ca.gov/HazardMitigationSite/Documents/002-2018%20SHMP_FINAL_ENTIRE%20PLAN.pdf

¹⁰² Feo, Teresa J., Amber J. Mace, Sarah E. Brady, and Brie Lindsey. 2020. The Costs of Wildfire in California An Independent Review of Scientific and Technical Information. California Council on Science and Technology. ISBN Number: 978-1-930117-66-2.

leading to increased susceptibility to erosion or landscapes. If the City's foothills become covered with dry, overgrown vegetation because of drought conditions, extreme heat events and high winds will increase the threat of wildfires.

Beyond direct damage to physical property and harmful effects on public safety, wildfires also result in secondary impacts: a major consequence of wildfires is post-fire flooding and debris flow. Wildfires can burn away ground cover and vegetation across the landscape, leaving soil exposed and easily erodible by precipitation. In other cases, fires can cause soil surfaces to harden. Instead of the rain soaking into the soil, rainwater and melted snow can rush across these hardened surfaces, gaining enough power to erode loose sediments.¹⁰³

Wildfires could alter hydrology by changing vegetation, increasing runoff, and resulting in more sediment that could block drainage and damage structures.¹⁰⁴ The wildfires are unlikely to directly burn and/or damage outfalls themselves due to construction materials and placement near bodies of water.

Conservation areas and open space in the City provide crucial ecosystem services such as the provisioning of clean air and water and climate regulation. If conservation areas are damaged, endangered species could be at increased risk to species survival. If habitats of sensitive species are subject to frequent disturbance or destruction, resources may be needed to conserve these species.

Sensitivity: Vulnerable Populations

Wildfires are a major public health concern as they can cause immediate health impacts through burns, injuries, and heat stress. However, a wildfire can influence the health outcomes of an area larger than the burn area because the associated smoke can travel long distances and worsen the air quality for extended periods. Wildfires can be a significant contributor to air pollution in both urban and rural areas and have the potential to significantly impact public health through particulates and volatile organic compounds in smoke plumes. Wildfires are a major source of particulate matter, which is an air pollutant that increases one's risk for respiratory illnesses, cardiovascular disease, negative birth outcomes, and premature death.¹⁰⁵ Wildfire smoke contains numerous primary and secondary pollutants, including particulates, polycyclic aromatic hydrocarbons, carbon monoxide, aldehydes, organic compounds, gases, and inorganic materials with toxicological hazard potentials.¹⁰⁶ Wildfire smoke also increases exposure to ground level ozone and toxic chemicals (e.g., pesticides, plastics, and paints) released from burned buildings and other man-made materials. Individuals sheltering in place are also at risk of exposure to hazardous air quality because wildfire smoke penetrates homes, particularly older homes.¹⁰⁷ Beyond these immediate health impacts, the stress, displacement, and

¹⁰³ United States Geological Survey. 2017. Increases in Wildfire-Caused Erosion Could Impact Water in the West. <https://www.usgs.gov/news/national-news-release/increases-wildfire-caused-erosion-could-impact-water-supply-and-2>. September 17. Accessed November 23, 2023.

¹⁰⁴ U.S. DOT. 2018. Transportation Climate Change Sensitivity Matrix. U.S. Department of Transportation. Retrieved from <https://toolkit.climate.gov/tool/transportation-climate-change-sensitivity-matrix>

¹⁰⁵ Bell, J.E., S.C. Herring, L. Jantarasami, C. Adrianopoli, K. Benedict, K. Conlon, V. Escobar, J. Hess, J. Luvall, C.P. Garcia-Pando, D. Quattrochi, J. Runkle, and C.J. Schreck, III, 2016: Ch. 4: Impacts of Extreme Events on Human Health. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 99–128.

¹⁰⁶ Künzli, N. et al. 2006. Health effects of the 2003 Southern California wildfires on children. *Am J Respir Crit Care Med*. 174:1221-8.

¹⁰⁷ Rudolph, L., Harrison, C., Buckley, L. & North, S. (2018). *Climate Change, Health, and Equity: A Guide for Local Health Departments*. Oakland, CA and Washington D.C., Public Health Institute and American Public Health Association.

loss of home and community from wildfires can cause significant mental health impacts, such as anxiety, depression, and post-traumatic stress disorder.¹⁰⁸

Outside of the property owners directly impacted by a wildfire event, wildfires can also impact seniors and persons with disabilities. During hazard events such as wildfires, flooding, or extreme storms, the elderly and other vulnerable populations, such as persons with disabilities, may require additional assistance to adequately respond. These groups may have limited mobility, be immuno-compromised, and/or not receive notifications regarding current conditions and evacuation requirements. For example, a senior who lives alone may not be aware that a wildfire is burning close to their residence and that they have been ordered to evacuate if those notifications were sent in manner that does not reach them. Persons with disabilities may require special mobility devices or caregiver assistance to go outside, which may not arrive as quickly as needed.

Vulnerable populations with an increased threat level to wildfire and smoke include lower-incomes, renters, the unhoused, and seasonal agricultural workers. These groups may not possess enough financial resources to purchase and operate air purifiers or rebuild their homes or search for new homes in the aftermath of a fire. The unhoused and seasonal agricultural workers have an additional risk as they are less likely to receive notification of this or other disasters because of a lack of access to information or technology or emergency notifications are not provided in a language they understand.

Adaptive Capacity

The City has addressed wildfire in planning documents such as the 2020 LHMP. The State of California also has regulations and programs in place that are beneficial during wildfires by limiting further potential public health impacts as further described below:

In similar acknowledgement of the escalating risk of wildfire, the State of California also issued several documents to assist in wildfire planning and preparation, detailed in the following sections.

Statewide Hazard Mitigation Plan

The State of California Multi-Hazard Mitigation Plan, revised in 2023, considers wildfire along with floods and earthquakes to be the three primary hazards faced by California.¹⁰⁹ The document notes the importance of SB 1241, which was passed in 2012 and mandates wildfire planning responsibilities by local agencies through requirements regarding:

1. Wildfire updates to General Plans;
2. Mandatory findings for subdivision approvals in SRAs and VHFHSZs; and
3. California Environmental Quality Act (CEQA) checklist updates for wildfire safety.

Fullerton Fire Department

The Fire Prevention Division conducts ongoing inspections for the purpose of life safety, reduction in property loss, weed and rubbish abatement, and the enforcement of federal, state and local fire regulations. The Emergency Management Division offers a variety of programs to help the community be prepared for fire, including the use of AlertOC, providing guidance of building a disaster preparedness kit, and preparing for a power outage.

¹⁰⁸ Hanigan, Ivan C., Colin D. Butler, Philip N. Kovic, and Michael F. Hutchinson. 2012. "Suicide and Drought in New South Wales, Australia, 1970–2007." *Proceedings of the National Academy of Sciences of the United States of America* 109 (35): 13950–55.

¹⁰⁹ California Governor's Office of Emergency Services. 2023 State Hazard Mitigation Plan. 2023

3.2.1.6 FLOODING

A flood occurs when land that does not normally have bodies of water becomes suddenly inundated with water. Flooding can occur after periods of heavy rainfall, whether it occurs as a single extreme episode or as a series of storms. When heavy rainfall hits an area where the ground is already saturated, the risk of flooding is high. In developed areas, the presence of pavement and other impervious surfaces means that the ground is less able to absorb water. As a result, rainwater must be carried away in storm channels or waterways. Drainages and stream courses may flood their banks and shores if their capacity is exceeded by rainwater.

Floods pose several threats to communities and public safety. Flooding can cause property damage, destroy homes, and carry away vehicles or other large debris. Topsoil and vegetation can be swept away by floodwaters, leading to erosion. Floodwater may impede the movement of victims fleeing a flood or of first responders attempting to reach people in need of help.

Climate models predict that California will experience less frequent but more intense storm patterns in the coming decades. The State's precipitation is expected to fall more frequently as rain rather than snow, compared to historical trends. Additionally, earlier and faster spring snowmelt--caused by higher temperatures--will cause the State's streams and rivers to swell more in some years. Scientists suggest the combination of these factors could lead to a 50 percent increase in runoff in future years, challenging the capacity of the State's existing reservoirs, canals, levees, and other flood control systems, and increasing the risk of inland flooding. Floods cause significant risk to human life, and damage roads, buildings, and other infrastructure.¹¹⁰

FLOODING

Increases in temperature and precipitation can lead to extreme precipitation events that could lead to flooding in the City. In the context of climate change for the City, this Vulnerability Assessment evaluated two types of climate-related floods: riverine and surface flooding caused by precipitation-driven events. The following describes the types of floods within each category.

Riverine and Surface Flooding from Precipitation-Driven Events

- **Inland flooding** occurs when moderate precipitation accumulates over several days, intense precipitation falls over a brief period, or river overflows because of an ice or debris jam or dam or levee failure.
- A **flash flood** is caused by heavy or excessive rainfall in a brief period, generally less than six hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through riverbeds, urban streets, or mountain canyons. They can occur within minutes or a few hours of excessive rainfall.

The following analyses describe riverine and surface flooding vulnerabilities resulting from projected climate change for the City.

Riverine and Surface Flooding from Precipitation Events

For the City, projections show only a slight change in average annual rainfall through the end of the century (**Table 3-3: Projected Change in Annual Average Precipitation: City of Fullerton**). Globally, climate change is anticipated to lead to more variability in the intensity of rainfall events from year to

¹¹⁰ State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. <https://lao.ca.gov/Publications/Report/4575>. Accessed December 11, 2023.

year and longer transitions between droughts and deluges.¹¹¹ Historically, the City has experienced an average of three extreme precipitation events¹¹² per year between 1960 and 1990. Under the medium emissions scenario, the City is expected to experience an average of four extreme precipitation events per year through the end of the century. Under the high emissions scenario, the City is expected to experience an average of five extreme precipitation events per year by the late century.¹¹³

The City has experienced flooding during heavy rainfall events. While the forecasted changes in Maximum 1-Day Precipitation — the greatest amount of daily rain or snow (over a 24-hour period) for each year — are not anticipated to substantially differ from historic records (see **Table 3-11: Projected Change in Maximum 1-Day Precipitation: City of Fullerton**), flooding can still occur. Impacts from flooding caused by the largest precipitation-driven events should not be dramatically different than what the community currently experiences, and adaptation solutions to address the flooding should be lasting.

Table 3-11: Projected Change in Maximum 1-Day Precipitation: City of Fullerton

Maximum 1-Day Precipitation (Inches)	Historic Maximum 1-Day Precipitation (1961 - 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	1.575	1.657	1.721	1.705	1.779

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Fullerton: Maximum 1-Day Precipitation. <https://cal-adapt.org/tools/local-climate-change-snapshot>. Accessed November 1, 2023.

Historical Riverine and Surface Flooding Events

- In March 2003, 3 to 7 inches of rain fell on Southern California, causing region-wide flooding. Water reached depths of up to three feet on some roadways, causing over 1,000 vehicle collisions.
- In January 2010, a strong storm delivered by the jet stream caused urban flooding throughout Southern California. A medical facility in nearby Santa Ana saw its roof cave in due to the heavy rain.
- In 2014 heavy rains affecting most of Southern California caused flooding on a section of Bastanchury Road that was nearly a foot deep. Nearby weather stations reported that more than an inch of rain had fallen in a span of three hours.
- In September 2015, flooding of roadways caused severe traffic congestion across Southern California, including Orange County. In the City of Los Angeles, 7,300 people lost power for most of the day, and there were more than 500 traffic collisions across the entire region as a result of the road conditions.¹¹⁴

Exposure

With climate change, the future is likely to be different from the past, with most models projecting more intense, but possibly less frequent, rainstorms. **Figure 3-6: Flood Hazard Zones** shows the mapped flood hazard zones for 100-year and 500-year flood (the 500-year floodplain is land that is covered in water during a flood event that has a 0.2 percent chance of being equaled or exceeded

¹¹¹ Swain, D. L. (2018). Increasing precipitation volatility in twenty-first-century California. *Nature Climate Change*.

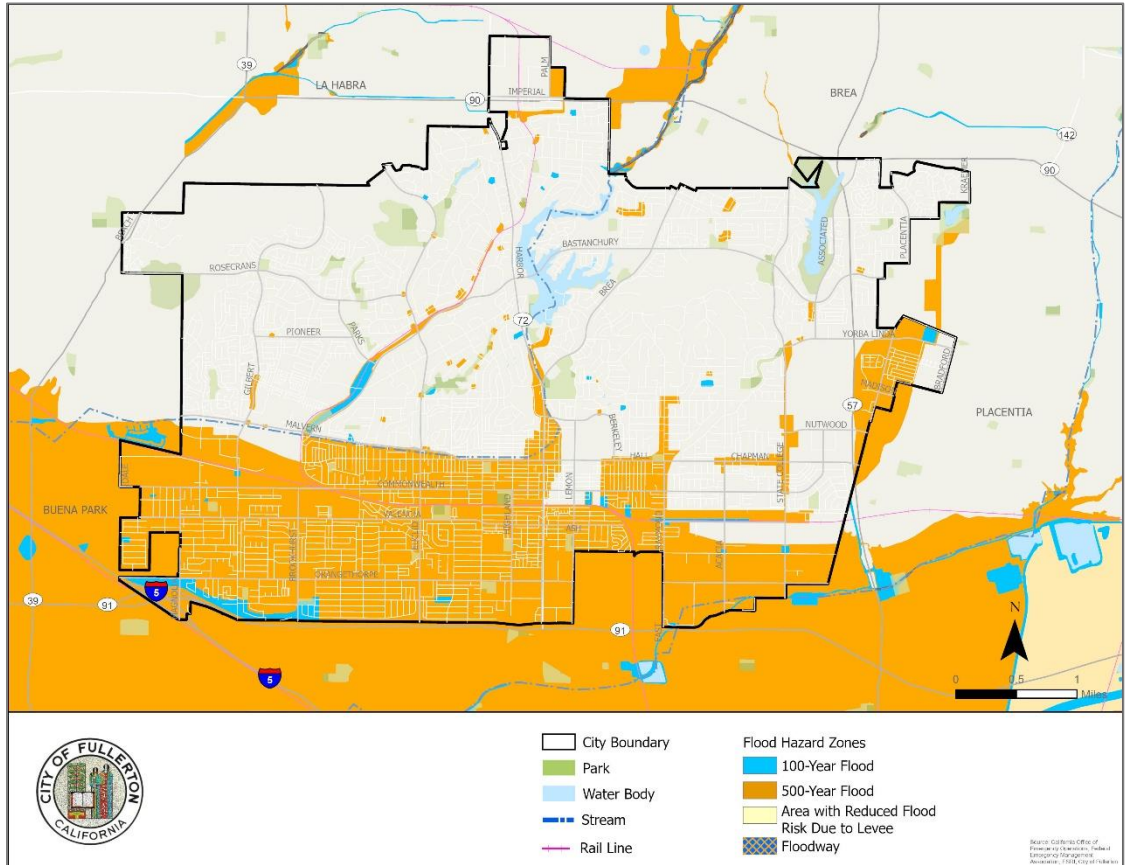
¹¹² Extreme Precipitation events are successive days in which the 2-day rainfall total is above a threshold of 1 inch.

¹¹³ California Energy Commission. Cal-Adapt Extreme Precipitation Events Tool. Available: <https://cal-adapt.org/tools/extremeprecipitation/>. Accessed December 11, 2023.

¹¹⁴ Fullerton, City of. 2020. Local Hazard Mitigation Plan.

each year) events in the City. Approximately 1 percent of the City is within the 100-year flood plain (0.3 square miles), whereas almost 32 percent is in the 500-year flood plain (7.14 square miles). Of special concern are the areas in the southern portion of the City, also identified as vulnerable communities according to FEMA’s Social Vulnerability Rating. These areas are within the 100-year and 500-year zones, and therefore highly susceptible to future flooding events.

Figure 3-6: Flood Hazard Zones



Sensitivity: Community Elements

If enough precipitation were to fall exceeding the storm drain infrastructure design capacity in the City, physical assets can expect to be inundated. Electronic or mechanical equipment on the ground could become waterlogged and nonfunctional. Emergency services may also be impacted.

AS the 2020 LMHP notes, flooding from a 100-year or 500-year storm event will primarily affect the southern section of the city, where the terrain is relatively flat. In the event of a major storm, runoff will flow rapidly to southern Fullerton from the higher-elevation northern areas of the city. Whereas a 100-year flood threatens just 2 critical facilities, a 500-year flood threatens 102 key facilities, among these are Fullerton City Hall and Community Center. **Table 3-12: Key Facilities at Risk of Flooding** shows the key facilities threatened by flooding in the City. Any facilities inundated with floodwaters are likely to experience power outages if the flood disrupts nearby electrical power grids. Computers and other electronic equipment stored on the ground would become inoperable and destroyed. Streets would become flooded and motorists as well as emergency personnel may not be able to reach their destinations.

Table 3-12: Key Facilities at Risk of Flooding

Facility Type	100-Year Flood		500-Year Flood	
	Critical Facility	Facility of Concern	Critical Facility	Facility of Concern
Community Services	0	0	1	6
Education	0	0	18	0
Energy	0	0	0	2
Medical	0	0	0	0
Museum	0	0	0	5
Municipal Government	0	0	0	2
Transportation	0	0	0	49
Utility	0	0	0	2
Water and Sewage	0	2	0	12
Total	0	2	24	78

Source: Fullerton LHMP 2020

Lifeline Utility Systems

Disruptions to communications (including fiber optic cables, data centers, and communications towers) impact all aspects of residents’ lives, from simple services to the complex and interdependent regional economy. Water damaged fiber optic lines can lead to disruptions in communications, which can be catastrophic during a disaster when communication is most essential. Flooded data centers could cause widespread damage to equipment, loss of data, and/or disruption of web-based services that use local data centers for hosting. Flood water can damage equipment at the base of communication towers and can even topple the towers if the water flow is fast enough, causing further damage to nearby homes and businesses.

Flood damage to energy infrastructure would mean interruptions in electricity supply and potentially blackouts. Public health and safety could be affected due to the temporary loss of power and community-wide disruption of transportation networks, businesses, homes, and daily life. Prolonged loss of grid power could result in backup systems for critical facilities being depleted, resulting in disruption of operations to hospitals and fire and police stations and threatening public health and safety.

Economic Elements

Renovations of commercial buildings may be necessary in areas of significant flooding, disrupting associated services. The tourism industry may also be affected by major flood events, as popular vacation areas tend to overlap with flood hazard zones.

Health Materials

Reentering and cleaning homes and buildings also presents hazards. Flooded buildings can pose significant health hazards to people entering them. Electrical power systems can become hazardous. Gas leaks can trigger fire and explosions. Flood debris—such as broken bottles, wood, stones, and walls—may cause injuries to those cleaning damaged buildings. Containers of hazardous chemicals may be buried under flood debris. Hazardous dust and mold can circulate through a building and be inhaled by those engaged in cleanup and restoration.

According to the 2020 Fullerton Local Hazard Mitigation Plan, In Fullerton the 100-year floodplain is not a contiguous area but consists instead of various pockets across the city. These include a residential area northeast of the intersection of I-5 and SR-91, a swath of land abutting Bastanchury Road between Parks Road and W Malvern Avenue, and other small pockets throughout the Coyote Hills. 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.¹¹⁵

Natural Resource Areas

Flooding events are projected to become more frequent and severe and can create significant ecosystem damage, compromising wildlife habitat from impacts such as erosion or sedimentation.

Sensitivity: Vulnerable Populations

Age and disability can affect the ability of individuals to prepare for a flood and to move safely before, during, or after a flood. Individuals 65 years and older are more likely to experience difficulties during flooding, as well as with preparing and responding to rapidly changing environments. As little as 6 inches of floodwater can make sidewalks, streets, and pathways difficult to navigate; the elderly may find withstanding such circumstances especially challenging. When public health infrastructure or services are affected by flooding or erosion, the elderly are more likely to be affected by a lack of services than other age groups and may be more physically compromised in seeking services. Floods and their aftermath present numerous threats to public health and safety:

- Unsafe food—Floodwaters contain disease-causing bacteria, dirt, oil, human and animal waste, and farm and industrial chemicals which can contaminate agricultural fields.
- Contaminated drinking and washing water and poor sanitation—Flooding impairs clean water sources with pollutants. The pollutants also saturate into the groundwater which may put people at risk by drinking contaminated water. Flooded wastewater treatment plants can be overloaded, resulting in backflows of raw sewage. Private wells can be contaminated by floodwater. Private sewage systems can become a cause of bacteria spread if they overflow.
- Floods provide new breeding grounds for mosquitoes in wet areas and stagnant pools.
- Mold and mildew — Flooding can cause the growth of mold and mildew in structures. Excessive exposure to mold and mildew can cause flood victims—especially those with allergies and asthma—to contract upper respiratory diseases.
- Carbon monoxide poisoning—In the event of power outages following floods, built-up carbon monoxide from natural gas appliances can poison people and animals.
- Mental stress – Experiencing a devastating flood can cause a long-term mental impact.¹¹⁶

¹¹⁵ Fullerton, City of. Local Hazard Mitigation Plan. 2020.

¹¹⁶ County of Santa Clara. Local Hazard Mitigation Plan. 2017.

Table 3-13: Vulnerable Populations: Flood Zones

	100 Year Flood Zone	500 Year Flood Zone	100 + 500 Year Flood Zones	City of Fullerton
Total Population ¹	1,279	62,381	63,660	144,363
Percent of residents that are children (less than 10 years old) ²	9.2%	12.9%	12.4%	10.6%
Percent of households that have people 65+ years old ¹	17.4%	23.1%	22.9%	28.2%
Percentage of households with at least one person living with a disability ¹	22.4%	24.8%	24.7%	21.2%
Median age ²	33.6	33.7	33.7	36.3
Total households ¹	578	20,109	20,687	48,739
Median household income ²	\$62,591	\$80,882	\$80,344	\$96,047
Percent of rental households ²	76.8%	61.0%	61.5%	49.7%
Percent of household income below	13.9%	13.8%	13.8%	11.2%

Source: US Census Bureau, ACS 2017 - 2021¹, US Census Bureau 2020 Summary File 1, ESRI Forecasts 2023²

Adaptive Capacity

The City has addressed flooding in planning documents such as the 2020 LHMP.

3.2.1.7 GEOLOGIC AND SEISMIC HAZARDS

In the context of climate change vulnerability, increased liquefaction (seismic) and heightened possibility of landslide (geologic) events are a concern. Both hazards are an indirect effect of increased precipitation and rising groundwater because soil must be saturated with water for liquefaction or landslides to occur. Both hazards can be triggered by seismic events such as earthquakes. Specifically:

- Liquefaction occurs when seismic energy shakes an area with low-density, fine grain soil, like sand or silt, which is also saturated with water. When the shaking motion reaches these areas, it can cause these loosely packed soils to suddenly compact, making the waterlogged sediment behave more like a liquid than solid ground.
- Landslides occur when earth on slopes becomes destabilized, typically after heavy rains, when the precipitation saturates the soil and makes it less stable, or when significant erosion from rainfall destabilizes the ground. Slopes that have recently burned face a greater risk from rain-induced landslides, as the fires burn the trees, brush, and other vegetation that help stabilize the earth.

Seismic Activity

Changes in the climate do not have a direct effect on seismic activity. However, seismic events such as an earthquake can cause liquefaction and landslides which are made worse by other conditions caused by climate change.¹¹⁷ California is seismically active because of movement of the North American

¹¹⁷ Liquefaction occurs when seismic energy shakes an area with low-density, fine grain soil, like sand or silt, which is also saturated with water. When the shaking motion reaches these areas, it can cause these loosely packed soils to suddenly compact, making the waterlogged sediment behave more like a liquid than solid ground. During liquefaction events, the liquified soil can lose most of its stability which can cause damage to buildings and infrastructure built upon it. In severe

Plate, east of the San Andreas Fault, and the Pacific Plate to the west, which includes the State's coastal communities. The transform (parallel) movement of these tectonic plates against one another creates stresses that build as the rocks are gradually deformed. The rock deformation, or strain, is stored in the rocks as elastic strain energy. When the strength of the rock is exceeded, rupture occurs along a fault.

There are several smaller fault lines that pass through or lie underneath Fullerton. The Puente Hills Blind Thrust System runs north-south through Fullerton. Sections of the Elysian Park and Yorba Linda fault lines pass through Fullerton's southwestern and southeastern areas, respectively. The Coyote Hills faults, a series of smaller, shorter faults, run through northern sections of Fullerton. One of these fault segments, located just north of the City, is located within an Alquist-Priolo Special Study zone.

In addition to these local faults, there are six major regional faults that could potentially impact Fullerton:

- The closest point to the Whittier-Elsinore Fault is 1.6 miles northeast of Fullerton.
- The closest point to the Newport-Inglewood Fault is 9.8 miles southwest of Fullerton.
- The closest point of the Sierra Madre/San Fernando Fault is approximately 14 miles north of Fullerton.
- The Palos Verdes Hills Fault is 20 miles southwest of Fullerton at its closest point.
- The San Jacinto Fault is 36 miles east.
- The San Andreas fault, the dominant fault system in Southern California, is 37 miles northeast of Fullerton at its closest point.

Local geology and groundwater conditions, as well as historical events, all influence which areas are susceptible to liquefaction. The Coyote Creek Floodplain in the northwest section of Fullerton contains an abundance of saturated, loose sandy soils at depths less than 40 feet. These sediment layers have the potential to liquefy in the event of an earthquake, causing this area to have a high liquefaction susceptibility. Although the Carbon Creek alluvial fan is composed of loose, sandy material, there is a low susceptibility because groundwater is relatively far below the surface. Since liquefaction occurs in areas with highly water saturated soil, areas of liquefaction with slopes are also known to trigger events known as "deep-seated landslides" which are landslides that occur when water accumulates in the soil underneath the slope's surface. The areas of West Coyote Hills and East Coyote Hills have a susceptibility to deep-seated landslide.¹¹⁸

Historical Earthquake, Landslide, and Liquefaction Events

- July 8, 1986. North Palms Springs Earthquake. The shock occurred in a complex setting along the San Andreas Fault Zone where it bisects San Gorgonio Mountain and San Jacinto Peak at the San Gorgonio Pass and was the first in a series of three earthquakes that affected southern California and the northern Owens Valley in July 1986. Between 29 and 40 people were injured, and financial losses were estimated to be in the range of \$4.5–6 million.
- January 17, 1994. Northridge Earthquake. The earthquake struck in the San Fernando Valley about 20 miles (32 km) northwest of downtown Los Angeles. The death toll was 57, with more than 9,000 injured. In addition, property damage was estimated to be \$13–50 billion (equivalent to \$24–93 billion in 2021).

cases, some buildings may completely collapse. Pipelines or other utility lines running through a liquefaction zone can be breached during an event, potentially leading to flooding or release of hazardous materials.

¹¹⁸ Fullerton, City of. Local Hazard Mitigation Plan. 2020.

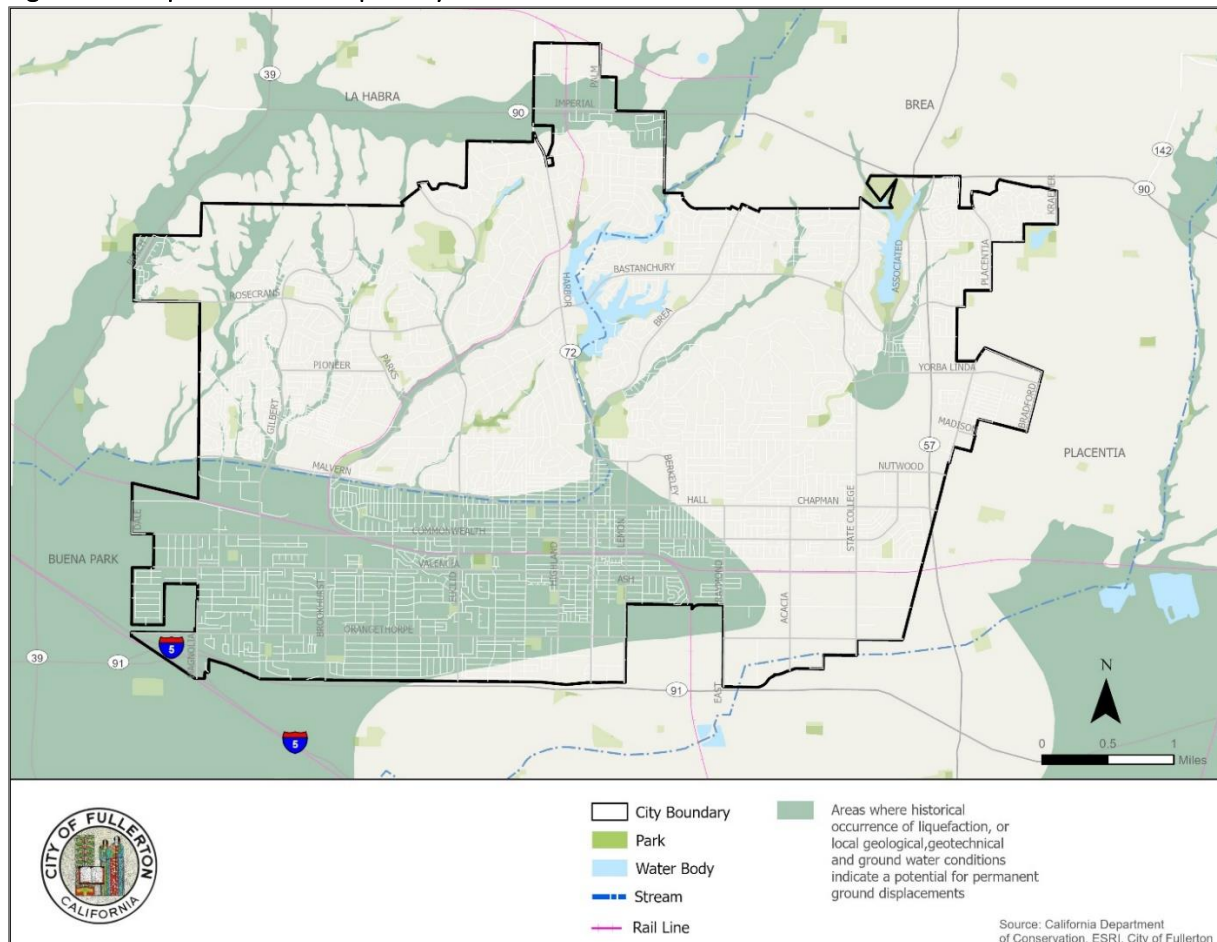
- March 28, 2014. La Habra Earthquake. The La Habra earthquake was caused by oblique thrust faulting on the Coyote Hills segment of the Puente Hills Thrust Fault System. The Puente Hills Fault is a blind thrust fault that runs north and west from Orange County to Los Angeles. The earthquake caused a total of \$10.8 million in damage in Orange County, with approximately \$1.5 million in Fullerton.¹¹⁹ Thirteen water mains broke in Fullerton, forcing roughly 70 families to be displaced from their homes after they were declared temporarily uninhabitable.¹²⁰

VULNERABILITY

Exposure

Figure 3-7: Liquefaction Susceptibility highlights areas with potential for liquefaction. The underlying dataset combine existing liquefaction areas from local maps and the National Earthquake Hazards Reduction Program which rates soils from hard to soft and known hydric soils from the United States Department of Agriculture Soil Survey to identify the potential areas where liquefaction may occur.

Figure 3-7: Liquefaction Susceptibility



¹¹⁹ Fullerton Observer. Mid-April 2014. North Fullerton Earthquake Damage. www.fullertonobserver.com

¹²⁰ National Geophysical Data Center /World Data Service (NGDC/WDS) (1972), Significant Earthquake Database (Data Set), National Geophysical Data Center, NOAA, doi:10.7289/V5TD9V7K.

Table 3-14: Liquefaction Susceptibility – Vulnerable Populations compares the population within the High and Very High liquefaction hazard zones within the entire City population. Of special concern to the City is that almost 26.2 percent of households have at least one person aged 65 and over in addition to 26.1 percent of households with at least one person living with a disability. While the data may represent the same households, the number of individuals within the High and Very High liquefaction susceptibility zones should be of special concern for the City when preparing for emergency events including evacuation.

Table 3-14: Liquefaction Susceptibility – Vulnerable Populations

	High and Very High Liquefaction	City of Fullerton
Total Population ¹	61,836	144,363
Percent of residents that are children (less than 10 years old) ²	12.3%	10.6%
Percent of households that have people 65+ years old ¹	26.2%	28.2%
Percentage of households with at least one person living with a disability ¹	26.1%	21.2%
Median age ²	34.1	36.3
Total households ¹	19,257	48,739
Median household income ²	\$86,574	\$96,047
Percent of rental households ²	54.8%	49.7%
Percent of household income below poverty level ¹	14.0%	11.2%

Source: US Census Bureau, ACS 2017 - 2021¹, US Census Bureau 2020 Summary File 1, ESRI Forecasts 2023²

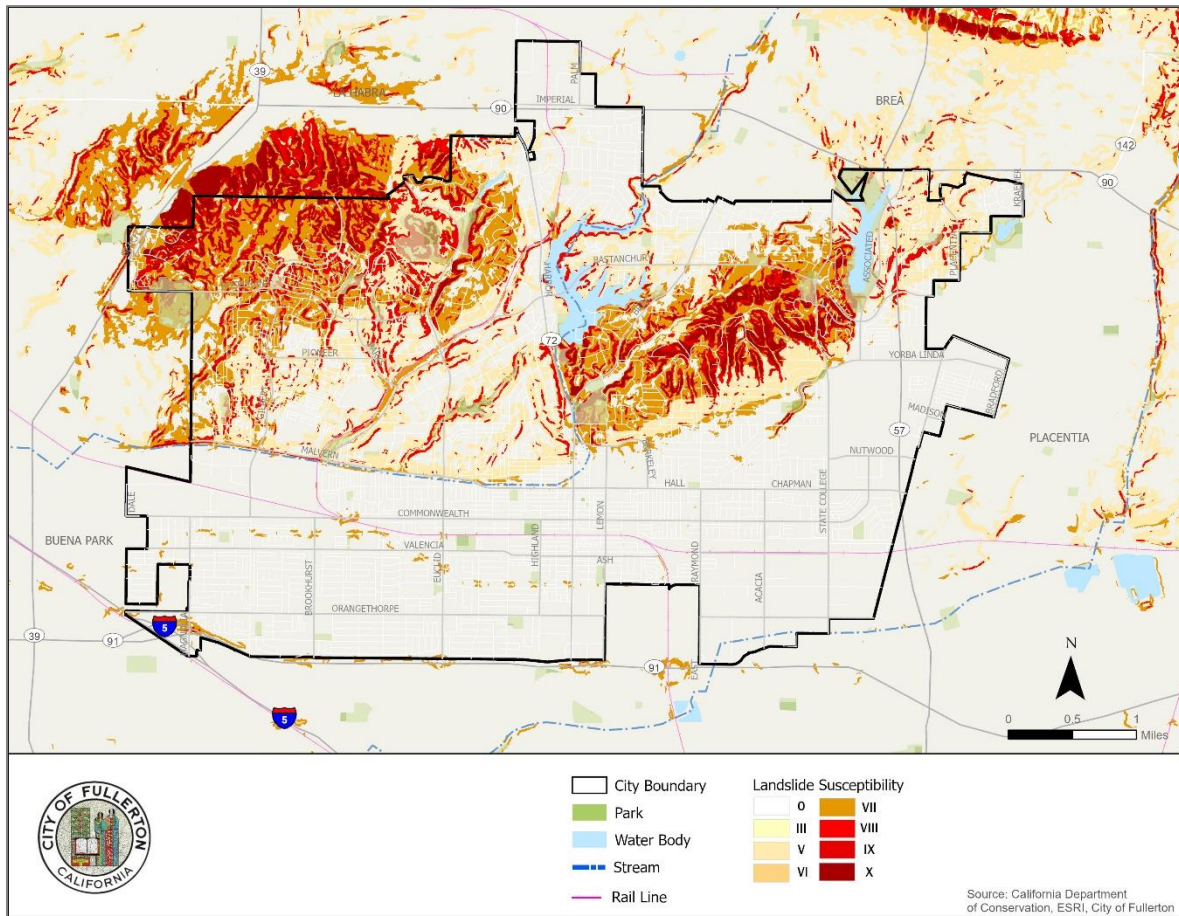
Landslides

Landslides occur when earth on slopes becomes destabilized, typically after heavy rains, when the precipitation saturates the soil and makes it less stable, or when significant erosion from rainfall destabilizes the ground. Slopes that have recently burned face a greater risk from rain-induced landslides as the fires burn the trees, brush, and other vegetation that help stabilize the earth. In general, landslide hazard areas are where the land has characteristics that contribute to the risk of the downhill movement of material, such as the following:

- A slope greater than 33 percent.
- A history of landslide activity or movement during the last 10,000 years.
- Stream or wave activity, which has caused erosion, undercut a bank, or cut into a bank to cause the surrounding land to be unstable.
- The presence of an alluvial fan (a triangle-shaped deposit of gravel, sand, and even smaller pieces of sediment, such as silt) indicates vulnerability to the flow of debris or sediments.
- The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel.

Earthquakes may also be a source of landslides as the shaking can destabilize already loosened soils. There is the potential for landslides in the steeper portions of the foothills of the City. These areas are characterized with steep topography and geologic units that can become unstable. **Figure 3-8: Earthquake Induced Landslide Zone** identifies the areas of the City that are considered vulnerable to seismic induced landslides.

Figure 3-8: Earthquake Induced Landslide Zone



Sensitivity: Major Community Elements

Liquefaction and Landslides

As climate change is anticipated to change the usual precipitation patterns in Southern California, including the City, periods of both rain and drought are anticipated to become more intense and frequent. Therefore, climate change could, depending on the circumstances, increase the future risk of liquefaction in the region.

Critical Facilities and Infrastructure

During liquefaction events, the liquified soil can lose its stability which can cause damage to buildings and infrastructure built upon it. In severe cases, buildings may completely collapse. (See Figure 3-7: Liquefaction Zones and Figure 3-8: Earthquake Induced Landslide Zone).

- Roads—Access to major roads is crucial after a disaster event. Services and mobility may be disrupted during and following a liquefaction event. Sidewalks, roadways, and pipelines may become fractured and disjointed because of the liquefying soils. Roads and sidewalks may be usable in some form, but a severe liquefaction event may render them impassible until they are repaired. Landslides may block roadways causing long-term disruptions to the roadway network, infrastructure systems and City capabilities.

- Bridges — Earthquake shaking, liquefaction and landslides can significantly damage bridges, which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, those bridges that cross water courses are considered vulnerable. Key factors in the degree of vulnerability are the facility’s age and type of construction and soil classification at the bridge support structure, which indicate the standards to which the facility was built.
- Water and sewer infrastructure — Water and sewer infrastructure would likely suffer considerable damage in the event of an earthquake. This factor is difficult to analyze based on the vast amount of infrastructure in City and because water and sewer infrastructure are usually linear easements. Without further analysis of individual system components, it should be assumed that these systems are exposed to breakage and failure. Distribution systems with older brittle pipes are vulnerable to shaking and liquefaction.
- Power Lines — Power lines are generally elevated above steep slopes but the towers supporting them can be subject to landslides. A landslide could trigger failure of the soil underneath a tower, causing it to collapse and rip down the lines.

According to the 2020 LHMP, a significant section of the lower southwest section of the city would be affected by liquefaction, potentially impacting 109 key facilities. As shown in **Table 3-15: Key Facilities Threatened by Liquefaction**, a seismic event could cause liquefaction that damages bridges, education facilities, utility infrastructure, and several other critical facilities and facilities of concern.

Table 3-15: Key Facilities Threatened by Liquefaction

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	4	1	5
Education	0	14	14
Energy	2	0	2
Emergency Gathering Areas	3	0	3
Medical	0	7	7
Museum	1	0	1
Municipal Government	7	0	7
Transportation	54	0	54
Utility	1	0	1
Water and Sewage	15	0	15
Total	87	22	109

Source: Fullerton LHMP 2020

Hazardous Materials

Hazardous materials, including chemicals used as byproducts of industrial activities, natural gas and oil pipeline ruptures could be a significant threat to human and environmental health if they are not properly stored, managed, and contained. Oil and natural gas lines could rupture, exposing flammable or toxic chemicals. A short section of the Crimson Pipeline carries crude oil cuts through the northeast corner of Fullerton. In addition, several oil pipelines carrying crude oil and refined product run through La Habra, Brea, Anaheim, and Buena Park. SoCalGas also runs a subterranean natural gas pipeline through the middle of the city that nearly divides northern and southern Fullerton in half. Although pipeline failures are low-frequency events, they can have disastrous consequences. Ruptures could lead to fires and explosions that cause serious injuries or fatalities as well as environmental

contamination of waterways. Oil and gasoline could contaminate groundwater and lead to costly and multiyear cleanup efforts if released into waterways.

In addition, records from the Department of Toxic Substances Control have found harmful levels of toxic chemicals that have leached into the soil as a result of industrial activities. These chemicals can leach into the soil and potentially contaminate groundwater aquifers.¹²¹

Economic Elements

Homes, schools, and public facilities may be damaged and would likely be rendered unsafe for occupancy if they experience any leaning or structural damage resulting from the liquefaction or landslides. In addition to potentially causing significant injuries or fatalities, this can cause economic harm and create a need for long-term emergency sheltering and temporary housing until these buildings can be reconstructed.

In consideration of future degradation of structures, the City will want to monitor the quality of older housing stock to ensure it is still safe in a liquefaction event. The U. S. Department of Housing and Urban Development may consider units substandard if they were built before 1940. An estimated 46.8 percent of housing units within the City (approximately 49,000) were built before 1940. The median year structures were built was 1969.¹²²

Natural Resource Areas

Earthquake-induced landslides in landslide-prone areas can significantly damage surrounding habitat. It is also possible for streams to be rerouted after an earthquake. Rerouting can change the water quality, possibly damaging habitat and feeding areas. There is a possibility that streams fed by groundwater wells will dry up because of changes in underlying geology. Landslides could affect sensitive ecological areas around the community, causing localized harm to the region's ecosystem, although widespread impacts are unlikely.

Sensitivity: Vulnerable Populations

Seismic shaking and fault rupture pose a significant threat to populations living or working near structures that are not retrofitted to withstand seismic activity. This could include lower-income households who are unable to afford the cost of seismically retrofitting their homes or renters living in substandard housing. Senior citizens (especially those living alone) and lower-income households could have more difficulty recovering from a seismic event that causes significant damage to their home. Households with residents aged 65 and older or have a disability, as there may exist challenges with mobility that may affect evacuation and response to a catastrophic event.

Adaptive Capacity

The City has addressed liquefaction and landslide events in planning documents such as Fullerton Local Hazard Mitigation Plan and other agency programs. Additionally, City plan check engineers utilize a City-wide GIS tool – the California Geological Survey's Earthquake Zones of Required Investigation - that is a standard practice in line with the California Building code.¹²³

¹²¹ Fullerton, City of. Local Hazard Mitigation Plan. 2020.

¹²² U.S. Census Bureau. American Community Survey. 2022 ACS 1-Year Estimates.

¹²³ Correspondence with Taylor Samuelson, Senior Administrative Analyst City of Fullerton on January 31, 2024.

CHAPTER 4. CLIMATE ADAPTATION FRAMEWORK

Preparing the City of Fullerton for the impacts of climate change requires significant investment in time and resources across all parts of the community, including businesses, health, emergency services, government, schools, infrastructure, culture, and natural resources. This chapter provides a list of general strategies and supporting actions the City of Fullerton can consider for future climate adaptation and resilience efforts. Actions are divided into climate hazard sections (and include a “City-wide” section), like the body of the Vulnerability Assessment as follows:

- Citywide
- Extreme Heat Events
- Drought
- Wildfire
- Flooding
- Liquefaction/Landslide

Development of climate adaptation strategies considered the following:

PLANNING AND COLLABORATION

The complexity and interconnectedness of climate change requires a significant investment in community engagement and education to increase awareness and resilience. In addition, land use, geography, and transportation network infrastructure necessitate comprehensive and multi-jurisdictional adaptation approaches and solutions in partnership with local, regional, and State partners. Programs that educate and inform residents, visitors, businesses, and local decision-makers can empower individuals to take actions to reduce risk for themselves. Programs that seek to bring community members together can create lasting connectivity among neighbors who can plan together to get out of harm’s way.

HEALTHY COMMUNITIES

Climate change can affect the health of residents, workers, and tourists. Impacts include respiratory impacts from smoke, heat-related illnesses, increasing allergies and asthma, food-borne and water-borne illnesses, and mental health impacts from extreme events. More frequent and severe storms, floods, heat waves, wildfires, and other extreme events create additional stresses to healthcare systems, employees, and infrastructure. Maintaining and improving physical and mental health should be a top priority.

As climate-related hazards are expected to worsen in coming decades, the community will need to increase their preparation, response, recovery, and mitigation efforts. The intent is to strengthen safety nets by expanding and strengthening community preparedness and resilience through collaboration, education, and lasting partnerships that emphasize community well-being.

CLIMATE EQUITY

As discussed in the Vulnerability Assessment, Climate change does not affect all residents evenly. Climate hazards can disproportionately affect vulnerable populations that may have a more challenging

time responding to hazard events because of age, language barriers, income, housing, or other characteristics. To address these differences, climate adaptation actions were developed to address the specific needs of those most vulnerable to hazards.

EMERGENCY PREPAREDNESS

Emergency preparedness requires proactive planning, strong communication, and reliable and clear sources of information available through multiple channels. To minimize the impact of potential disasters for community members, the City plays a key role in making sure residents and visitors have the correct information about what to do and where to go in the event of a disaster. Individuals also have a responsibility in emergency preparedness, and should stay informed, prepare emergency kits, and otherwise take precautions to minimize risk to themselves and their families. In addition, clear evacuation protocols, planning, and practice are crucial factors for community preparedness.

Future planning efforts should focus on regional connectivity and communication, engaging the right regional partners in evacuation planning, optimizing the City and Orange County evacuation protocols, and identifying key potential challenges in regional evacuations.

RESILIENT BUILDINGS

Fullerton development includes a mix of buildings, including master-planned communities and neighborhoods of single- and multi-family homes, along with commercial and industrial buildings. Upgrades to business and residential structures to reduce fire-, flood-, geologic-, and seismic-related vulnerability can be combined with efforts to increase energy efficiency and reduce greenhouse gas emissions. Both objectives lead to meaningful climate action that saves money and improves quality of life for residents and promotes a sustainable economy.

RESILIENT INFRASTRUCTURE

Implementation and management of City infrastructure will determine how well it can protect residents and accommodate or mitigate future climate and extreme weather impacts. As the City does not directly own or operate all the critical infrastructure (e.g., electricity, water, or telecommunications), it must work directly with those companies, agencies, and organizations to enhance the resilience of those systems. Continuous investment in transportation infrastructure may be needed to facilitate mobility throughout the City in both everyday life and during an emergency.

RESILIENT ECOSYSTEMS

Natural systems provide valuable functions to both residents and visitors in the form of ecosystem services (water storage, etc.) within watersheds and open spaces. Natural lands and open space are increasingly being affected by climate change and will need to be managed for continued natural function.

Notes on the Evaluation and Implementation of Climate Adaptation Actions

As part of the adaptation assessment process, potentially relevant adaptation actions were collected through research of Fullerton planning documents (e.g., Local Hazard Mitigation Plan), other climate adaptation plans in the State of California, and from communities across the country. These actions were modified specifically for Fullerton and should be updated accordingly as adaptation planning and implementation processes progress.

Actions listed can be complementary, directly dependent on the implementation of another action (before or after), implemented in conjunction (or sequentially) with other actions, or mutually exclusive of one another.

Citywide Actions (CW)

CW-1: Prioritize climate change adaptation planning

- Continue to update the climate vulnerability assessment and Local Hazard Mitigation Plan (LHMP) as required by regulation to comprehensively plan for current and future natural and human-caused hazards within the City.
- Integrate climate science and projected climate-related impacts in all City planning documents, policies, programs, and ordinances as they are reviewed or updated.
- Provide training for staff about the impacts of climate hazards as part of the Risk Management functions of the City.
- Continue to integrate mitigation actions from the current LHMP into major capital improvement projects planning and development, including the potential relocation of critical facilities.

CW-2: Partner with surrounding local, regional, State, and Federal partners to support social and economic resilience

- Coordinate with Orange County so mitigation actions in both the County's and Fullerton's hazard mitigation plans can lead to a more regionally unified hazard mitigation strategy.
- Coordinate with surrounding municipalities and Orange County to enhance evacuation and emergency management protocols, agreements, and processes.
- Provide residents, businesses, and neighborhood organizations evacuation procedures and shelter-in-place guidelines to increase community resilience.
- Coordinate with regional health care facilities to ensure effective care for all City residents and visitors during an emergency.
- Create a rapid response plan from among Fullerton's and Orange County's first responders to secure hospital, nursing and assisted living facilities located within high hazard zones.

CW-3: Maintain City operations for community resilience

- Install backup generators at key critical facilities (City Hall, Fire Stations, Police Stations, water pumps, etc.) in the event of power loss during an emergency. Install portable generators in City-owned water facilities.
- Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Fullerton Public Library, and any others that the City may so designate in the future.
- Continue to designate, maintain, and promote to the community use of City Parks and Recreation facilities as emergency shelters.

CW-4: Strengthen community resilience through collaboration and education

- Work with local community organizations to develop a climate change education outreach program focused on residents, especially environmental justice, LatinX, and other community organizations as they identify gaps in vulnerable community resilience planning and further engage vulnerable community members.
- Expand participation in the Fullerton Community Emergency Response Team (CERT) program for residents and businesses.
- Evaluate and enhance existing preparedness and evacuation programs to better educate, inform, and engage the public about emergency preparedness in the case of a disaster.
- Identify gaps in current communication pathways to effectively notify the community of impending hazards (e.g., AlertOC, Fullerton School District website and Blackboard Connect).

CW-5: Collaborate with local businesses on economic and community resilience

- Work with local businesses and organizations to conduct regular workplace emergency preparedness drills, create or update disaster recovery plans, and ensure adequate evacuation planning is conducted.
- Develop agreements with hotels to designate them as Red Cross facilities in case of an emergency.

CW-6: Collaborate with school districts to develop emergency preparedness programs

- Explore agreements with local school districts so that school facilities can act as evacuation sites during major emergencies.
- Identify opportunities to use school facilities as evacuation centers, cooling centers, and charging stations, during extreme heat or severe weather events.

CW-7: Coordinate with regional and local transportation and transit agencies to ensure continued access and movement in the event of an emergency.

- Coordinate with Caltrans and Orange County Transit Authority to assess the vulnerability of transportation infrastructure and primary evacuation routes to hazardous climate-related events.
- Develop smart transportation demand management systems to respond to increased volumes of traffic during an evacuation.

CW-8: Coordinate with regional utilities to enhance the preparedness, protection, and resilience of water, energy, and telecommunications infrastructure.

- Coordinate with regional utilities to assess the vulnerability of critical infrastructure to hazardous climate-related events and harden as necessary to reduce risk of breach.

Extreme Heat Events (EH)

EH-1: Prepare the community for extreme heat events

- Work with regional and local health agencies to evaluate extreme heat warning thresholds and protocols and incorporate enhanced extreme heat preparedness into local operations.
- Establish a City-wide Heat Alert Program (HAP) when weather forecasts predict heat waves or extreme heat days.
- Educate vulnerable community members and their caregivers (e.g., aging, elderly, ill) to detect signs and symptoms of, and to prevent heat-related illness. Emphasize the importance of immediate medical assistance for heat-related illness.

EH-2: Develop facilities and resources to reduce the effects from extreme heat events

- Expand number of publicly operated cooling centers based on the need of vulnerable populations.
- Collaborate with local businesses and institutions to provide a “Cool Zone” area network (i.e., cooling centers).
- Develop a tree and shade master plan with a particular focus on climate resilient tree species.

Drought (D)

D-1: Collaborate with agency partners to prepare for future drought conditions

- Collaborate with Orange County Water District and Federal, State, and local agencies to explore alternative sources and improve groundwater supplies, including groundwater recharge.

D-2: Develop and implement City-wide efforts to increase drought resilience

- Continue to update and implement the Fullerton Water Shortage Contingency Plan.
- Launch a pilot program with smart water meters to track water usage in commercial and industrial properties across the City.
- Promote nature-based methods and BMPs (e.g., bioswales, natural ground cover) through the City's stormwater program.
- Continue to plan for, and respond to, incidents of tree mortality; drought resilience of public landscapes; and pest management concerns.

D-3: Promote community water conservation measures

- Support Orange County Water District in education and outreach efforts focused on water conservation measures (e.g., water reuse, water use, and irrigation efficiency) for City residents.
- Encourage drought tolerant native landscaping, low-flow water fixtures, and apply daytime watering restrictions (as necessary) on properties throughout the city to reduce water consumption.

Wildfire (WF)

WF-1: Collaborate with regional partners to reduce the impacts from wildfire

- Create and routinely update a Community Wildfire Protection Plan for fire prone areas within the city.
- Promote and implement the Orange County Vegetation Management program to reduce wildfire risk.

WF-2: Implement actions to reduce flammable materials in wildfire zones

- Update the Community Forest Master Plan, incorporating drought strategies and wildfire vulnerabilities into the planning framework.
- Remove highly flammable vegetation in fire prone areas and replant with fire-adapted specimens.
- Create a hillside weed abatement pilot program using goats or other livestock to reduce fuel loads in fire-prone areas.
- Plant fire-resistant, drought-tolerant groundcover on slopes, inclines, and hillsides to reduce runoff and erosion during heavy rainfall.

WF-3: Educate the community about wildfire for improved public safety and resilience

- Expand the fire hazard prevention awareness campaign to residents in the fire prone areas.
- Support regional partners (e.g., Orange County Fire Authority's Ready, Set, Go Program) in their efforts to educate residents about defensible space, vegetation management, and home hardening efforts.

Flood (F)

F-1: Coordinate with relevant agencies to better plan and prepare emergency services required for flooding events.

- Monitor stormwater management infrastructure and identify changes in flooding patterns and locations related to changing climatic conditions.

F-2: Develop or update long-term public works plans for critical facilities to address current and future flood risk.

- Require that future transportation infrastructure projects consider current and future flood risk and align the projected lifespan of the project with best available science.
- Explore and implement Low Impact Development (LID) standards for new development to reduce the amount of stormwater runoff.
- Draft an ecosystem restoration plan and upgrade of drainage systems in Gilman Park and other similar areas in Fullerton.

F-3: Educate the community about flooding for improved public safety and resilience

- Implement an outreach program to increase the public awareness of flooding, stormwater management, and drought management issues and techniques for residents to mitigate those challenges on their property, including availability of flood insurance.
- Partner with Orange County Public Works to proactively disseminate information from the “H2OC Stormwater Program” to educate home and small business owners on regulations and highlight the role that engaged residents can play to assist with community-based stormwater management.

F-4: Ensure resilience and long-term functionality of stormwater and sewer systems.

- Update the City’s Drainage Area Master Plan on a regular basis to incorporate new data and/or address emerging issues.
- Conduct comprehensive visual and functional test monitoring and asset condition assessment. Model potential impacts to utility infrastructure under future flooding scenarios.
- Conduct frequent cleanings of storm drain intakes, especially before and during the rainy season.
- Create areas with permeable pavements and/or catchwater systems as an interim solution to flood control channel expansion.

Liquefaction and Landslide (L)

L-1: Coordinate with local and regional partners to prepare and respond to liquefaction and landslide events

- Coordinate with Orange County Water District on subsidence monitoring in areas of active groundwater extraction and develop strategies based on the amount and severity of subsidence occurring.
- Improve local understanding of the threat of a major earthquake by conducting a city-wide scenario modeling potential loss of life and injuries, destroyed and damaged structures, and interruptions to key services.

L-2: Educate the community about seismic and geologic events for improved public safety and resilience

- Provide information to the community to prepare for, and recover from, a seismic or geologic event.
- Promote retrofit of key community facilities not owned by the City.

L-3: Design facilities to be resilient to seismic and geologic events

- Regularly update an inventory of buildings within the City that may be seismically vulnerable (adobe brick, unreinforced masonry, etc.)
- To the extent feasible, construct all new and significantly retrofitted City-owned facilities to remain operational in the event of a major earthquake.
- In coordination with Caltrans, update facilities condition assessments for bridges along evacuation routes to identify bridges that need seismic retrofitting.
- Build retaining walls, install shotcrete, and drape catch-fall nets on slopes or areas where landslides are likely to occur on public property.
- Install water runoff catchment troughs to channelize and divert rainwater away from hillsides on public property.

Attachment No. 1
Exhibit B

Goals 7, 12, 13, 18, 19, 20, 24 and 26 of The Fullerton Plan

GOAL 7:

Growth and development aligned with infrastructure capabilities.

Region/Subregion Level

P7.1 Balanced Decision Making

Require that all new development and major redevelopment have adequate infrastructure in place to support daily demands and emergency response capabilities.

A7.1(a)

Develop a program which evaluates the emergency infrastructure capabilities of potential development sites prior to issuance of construction permits.

City Level

P7.2 Housing Growth

Require that all new development and major redevelopment be located in areas previously identified as having adequate infrastructure capacity to accommodate future housing requirements. (See Chapter 2: Housing for related policies.)

P7.2.1 Adequate Infrastructure

Require that new development and major redevelopment are appropriate in scale to current and planned infrastructure capabilities, if not, require infrastructure upgrades are completed prior to issuance of certificate of occupancy.

Neighborhood/District Level

P7.3 Infrastructure Planning

Ensure infrastructure meets current and future daily demands and fire flow requirements while still meeting desired neighborhood/district character.

P7.4 Focus Area Planning

Support projects, programs, policies, and regulations to evaluate infrastructure capabilities as part of community-based planning of Focus Areas.

Project Level

P7.5 Appropriate Development Scale

Support projects, programs, policies, and regulations to ensure that development is appropriate in scale to current and planned infrastructure capabilities.

GOAL 12:

Proactively addressing public safety concerns.

Region/Subregion Level

P12.1 Healthy Family Development

Support programs that strengthen regional partnerships between public safety and human services agencies to encourage strong family relationships, reinforce healthy child development and encourage lawful behavior.

P12.1.1 Encourage Regional Cooperation

Encourage regional partnerships and mutual aid agreements between the City and other agencies/entities, further strengthening emergency response capabilities within the City and region.

P12.2 Collaboration with Outside Agencies

Support regional and subregional efforts to prevent violence, child abuse, sexual assault, domestic violence, illegal use of firearms, violence associated with substance abuse, crimes against property and other similar issues.

P12.2.1 Fire Risk Reduction Coordination

Coordinate with local and regional agencies (Fullerton Fire Department, Orange County Fire Authority, Cal Trans, etc.) and require vegetation management and long-term maintenance of fire hazard reduction projects (including community fire breaks) on all private and public roads and properties in the WUI and in fire hazard severity zones.

City Level

P12.3 Community Confidence Building

Support policies and programs that bolster productive communication and problem solving between public safety personnel and the Fullerton community.

P12.3.1 Natural Hazards Education

Establish a public outreach education program (with special attention to at risk populations) which educates residents and businesses about the natural hazards in Fullerton.

P12.3.2 Fire Risk Reduction Education

Educate residents (with special attention to at risk populations) and businesses on the City's vegetation management practices, including fire safety, landscape installation and maintenance, defensible space, and other fire hazard reduction strategies.

P12.3.3 Evacuation Outreach/Education

Conduct public outreach and educational activities associated with emergency evacuation routes and procedures, prioritizing efforts towards at-risk populations.

P12.3.4 Emergency Planning Outreach

Publicize and participate in disaster preparedness exercises and distribute emergency planning information to residents and business owners.

P12.4 Balance Safety Needs

Support policies, projects, programs, and regulations that balance the need to reduce vehicle accidents, injuries, and deaths through traffic calming and street design with the need to facilitate emergency response times.

P12.4.1 Street Name Regulations

Ensure street naming and numbering systems adequately identify properties in compliance with Fire Safe Regulations, adopted California Fire Code (CFC), and local ordinances, to avoid potential confusion for emergency response vehicles.

P12.4.2 Fire Regulations

Regularly re-evaluate specific fire hazard areas and adopt reasonable safety standards covering such elements as vegetation management around homes, adequacy of existing and future water supplies, fire flow tests, fire hydrants, routes or throughways for fire equipment access, clarity of addresses and street signs, and long-term maintenance in compliance with Fire Safe Regulations, adopted CFC, and local ordinances.

P12.4.3 Fire Hazard Reduction

Require all developments located in the WUI and VHFHSZ to meet or exceed statewide Fire Safe Regulations (title 14, CCR, division 1.5, chapter 7, subchapter 2, articles 1-5 (commencing with section 1270) (SRA Fire Safe Regulations) and title 14, CCR, division 1.5, chapter 7, subchapter 3, article 3 (commencing with section 1299.01) (Fire Hazard Reduction Around Buildings and Structures Regulations)).

A 12.4.3 (a)

If proposed, ensure any fire breaks and other fire defense improvements on public and private property are adequately funded and maintained in perpetuity in compliance with California Fire Code and local adopted ordinances.

P12.4.4 Fire Regulation Coordination

Coordinate with the Fullerton Fire Department and Orange County Fire Authority on the need for additional fire prevention regulations for the built out, populated areas of the City.

A12.4.4(a)

Design and ensure all private roads are maintained to permit unrestricted emergency equipment and personnel access in compliance with the California Fire Code, and local ordinances.

P12.5 Community Preservation

Support policies, programs and regulations pertaining to proactive code enforcement methods which reinforce the proper maintenance of properties, buildings and landscapes, and adherence to applicable regulations, while discouraging conditions that foster vandalism and more serious crime.

P12.6 Youth Community Safety Partnership

Support programs that involve young people in discussions about crime and prevention, increase youths' attachment to the community, engage youth in productive activities, and reinforce success in education.

P12.7 Fire Code Amendments

Support policies, programs and regulations that give the Fire Marshall flexibility to approve streets and fire lanes with reduced clearance requirements when other fire safety factors are incorporated into the project (such as street

connectivity, traffic safety and the presence of sprinkler systems).

P12.7.1 THIRA*

Support projects, programs, policies and regulations that facilitate the preparation of a THIRA (Threat and Hazard Identification Risk Assessment) plan in accordance with FEMA guidelines that allows Fullerton to plan for and address the risks of human-caused hazards.

P12.7.2 Periodic Updates

Periodically update and incorporate the THIRA into the Local Hazard Mitigation Plan (LHMP) and Emergency Operations Plan (EOP) updates.

P12.7.3 Code Compliance

Require new developments and major remodels or renovations to comply with the California Building Code, California Fire Code, and local adopted ordinances for construction and adequacy of water flow and pressure, ingress/egress, and other measures to ensure adequate fire protection.

Neighborhood/District Level

P12.8 Airport Safety Standards

Support policies, projects, programs and regulations that provide for safe and efficient airport operations through compliance with the Fullerton Municipal Airport (FMA) Master Plan and the Airport Land Use Commission for Orange County's Airport Environs Land Use Plan for FMA and the Airport Environs Land Use Plan for Heliports.

P12.9 Neighborhood Safety Strategy

Support policies, projects, programs and regulations that strengthen partnerships and community-based efforts, such as Neighborhood Watch, to reduce crime through prevention, education and enforcement, and encourage communities to build block-by-block networks to prevent crime, develop social ties and solve common problems.

P12.10 Community Involvement in Crime Prevention

Support policies and programs that involve the community in supporting informal monitoring, participating in legitimate activities and building a sense of ownership and control over neighborhoods.

P12.11 Public Safety in Focus Areas

Support projects, programs, policies and regulations to proactively address public safety concerns as part of community-based planning of Focus Areas.

P12.11.1 Accessible Outreach Materials

Ensure that all emergency preparedness and public safety educational materials are made available in all relevant languages for the residents of Fullerton, including English, Spanish, Tagalog, Korean, and Chinese.

P12.12 Crime Prevention

Support policies, programs and regulations that implement crime prevention strategies that have demonstrated success, including Crime Prevention Through Environmental Design (CPTED), Crime-Free Multi-Housing, Business Watch; Neighborhood Watch, iWatch and other similar strategies.

P12.12.1 Emergency Response Capability

Maintain a high level of emergency response capability.

A12.12.1(a)

Ensure annual budgeting cycles account for current and future emergency service needs.

A12.12.1(b)

Periodically assess and update the City's priorities for future emergency service needs.

P12.12.2 Maintenance and Training

Support enhancements to fire service through the maintenance of fire equipment and the training of fire personnel.

P12.12.3 Emergency Management Planning

Coordinate the City's emergency management planning with local jurisdictions and regional agencies to anticipate cumulative impacts during times of disaster.

Project Level

P12.13 Safety through Design

Support policies, projects, programs and regulations that make crime prevention and the maintenance of public safety service levels considerations in design and management of existing and new private and public spaces.

P12.14 Fire Protection Plans

Require fire protection plans (consistent with requirements of the California Fire Code, including a risk analysis, fire response capabilities, fire safety requirements (defensible space, infrastructure, and building ignition resistance), mitigation measures and design considerations for non-conforming fuel modifications, wildfire education maintenance and limitations, and evacuation plans for new development and major remodels in Very High Fire Hazard Severity Zones (VHFHSZ) and Wildland-Urban Interface (WUI) areas designated by the City and CAL FIRE.

A12.14 (a)

Ensure fire protection plans developed during the development review process address issues associated with restricted and single points of access, parking restrictions, and investigating the feasibility of establishing special assessment districts to improve road capacity and adequate water supply.

GOAL 13:

Responsive to public safety needs.

Region/Subregion Level

P13.1 Inter-City Coordination

Support regional and subregional efforts to: coordinate as appropriate Continuity of Operations Plan, plans and procedures for Emergency Operations Centers, and emergency response training systems; maintain inter-agency and public communications systems that will provide mutual aid and be reliable during and following an emergency; and, formulate definitive plans and procedures for evacuation of hazard-prone areas and high risk uses.

City Level

P13.2 Adequate Resources for Emergencies

Support policies and programs that ensure adequate resources are available in all areas of the City to respond to health, fire and police emergencies.

A13.2 (a)

Ensure emergency personnel are included in the development review process to ensure that new development adequately addresses service levels, security concerns, and safety.

P13.3 Disaster Hazard Reduction

Support policies, projects, programs and regulations that reduce structural and nonstructural hazards to life safety and minimize property damage and resulting social, cultural and economic dislocations resulting from future disasters.

P13.4 Disaster Risk Reduction

Support programs that promote greater public awareness of disaster risks, personal and business risk reduction, and personal and neighborhood emergency response.

P13.4.1 Post-Disaster Recovery

Expand and enhance the strategy for post-disaster recovery that focuses on community resilience, sustainability, and an evaluation for redevelopment potential following a major disaster.

P13.5 Community Emergency Preparedness

Support policies, programs and regulations that ensure the City, its residents, businesses and services are prepared for effective response and recovery in the event of emergencies or disasters, including the provision of information about the current nature and extent of local safety hazards and emergency plans, including evacuation plans and procedures to accommodate special needs populations. Information should be provided in multiple languages to maximize understanding by community members.

P13.5.1 Effective Evacuation

Require new development, redevelopments, and major remodels ensure effective future evacuations during emergencies by supporting feasible enhancements to the City's evacuation network and facilities.

P13.5.2 Minimum Emergency Access Points

Require all new developments and redevelopments within fire hazard severity zones, and the WUI, provide a minimum of two points of access by means of public roads that can be used for emergency vehicle response and evacuation purposes, where practicable.

P13.5.3 Functionality in Hazardous Events

Maintain functionality, make improvements, and expand the capacity, where feasible, of the existing emergency evacuation routes within the City, taking into account current and future natural and human caused hazards.

P13.5.4 Community Outreach for Evacuation

Conduct public outreach and educational activities associated with emergency evacuation routes and procedures, prioritizing efforts towards at-risk populations.

P13.5.5 Maintain Adequate Access

Ensure existing development in areas with sufficient water supply infrastructure and roadway capacity to maintain adequate evacuation and emergency equipment access do not degrade as a result of new development.

A13.5.5(a)

Identify the feasibility of constructing additional emergency access improvements for existing developments that do not meet minimum road standards for emergency equipment, such as:

- Additional vehicle pullouts at key hillside locations.
- Limiting or restricting on-street parking at key hillside locations.
- Potential for construction of new or improved emergency access routes.
- Roadside clearance improvements.

P13.5.6 Enhancing Evacuation

Require new development, redevelopment, and major remodels ensure effective future evacuations during emergencies by supporting feasible enhancements to the City's evacuation network and facilities.

P13.5.7 Emergency Evacuation Capacity

Maintain functionality, make improvements, and expand the capacity, where feasible, of the existing emergency evacuation routes within the City, taking into account current and future natural and human caused hazards.

P13.6 Inter-Department Coordination

Support policies and programs that improve the coordination of disaster-related programs within City departments.

P13.6.1 Mutual Aid Agreements

Expand or enhance mutual aid agreements to further enhance City capabilities during an emergency incident.

P13.7 New Technologies for Fire and Police Services

Support policies, programs and regulations which are based on research and evaluation and that implement new technologies and methods to improve the efficiency and effectiveness of fire and police services.

P13.8 Staff Training on Structural Risks

Support programs for ongoing staff training focused on the risks posed by older structures and infrastructure, as well as how to reduce those risks.

P13.8.1 Seismic Structures Compliance

Comply with State statutes and requirements regarding the identification and retrofit of seismically vulnerable structures.

P13.8.2 Retrofit Guidelines

Develop retrofit guidelines for existing non-conforming properties to understand what improvements may be necessary to comply with the California Fire Code, local ordinances, and best management practices.

A13.8.2 (a)

Create an inventory of all structures in the City that do not meet current seismic and fire safety standards.

A13.8.2 (b)

Create a retrofit incentive program to assist property owners in bringing these buildings into compliance.

P13.9 Nuisance Enforcement

Support policies, programs and regulations that maintain or strengthen code enforcement as an important tool to uphold community health, safety and welfare consistent with the provisions of the Fullerton Municipal Code.

P13.10 Community Education on Emergency Preparedness

Support policies and programs to involve and educate the Fullerton community in emergency preparedness.

P13.11 Essential Facilities Location

Ensure new public/critical facilities (schools, hospitals, fire stations, etc.) are not located in Fire Hazard Severity Zones to the greatest extent feasible. If located in these areas, ensure full compliance with California Fire Code and local ordinance and adequate fire response and evacuation capabilities are available.

GOAL 18:

Citizens that are actively involved in shaping the community's future and overall quality of life.

P18.1 Regional Participation

Support programs that encourage local participation in regional planning, decision-making and activities that affect the City of Fullerton and its residents.

P18.2 Multi-Jurisdiction Outreach Tools

Support regional and subregional efforts to develop new outreach tools, such as a clearinghouse feature on cities' websites for use by other public entities and regional agencies (such as school districts, universities, neighborhood organizations, transportation agencies, etc.) to post notices of items under their jurisdiction.

City Level

P18.3 Opportunities for Community Involvement

Support policies, projects, programs and regulations that maximize opportunities for public participation in planning and decision-making processes pertaining to community development and design, including outreach to members of underrepresented communities.

P18.4 Volunteerism and Civic Activities

Support policies and programs that support opportunities for volunteerism and engagement of community members in civic activities.

P18.5 Transparent Government

Support policies, programs and regulations that maintain transparency in municipal operations and decision-making by being clear about City objectives and providing access to information, City staff and decision makers.

P18.6 Accessible Participation

Support policies, projects, programs and regulations that take all feasible steps to ensure that everyone interested in participating in community forums has the materials necessary to contribute to informed decisions.

P18.7 Diverse Representation

Support policies and programs that facilitate full representation of Fullerton's diverse community on City committees and commissions.

P18.8 Low- or No-Cost Meeting Facilities

Support policies and programs that provide and promote opportunities for low- or no-cost meeting rooms in City facilities for community groups and local organizations as incentives for strengthening community engagement.

P18.9 Youth Engagement

Support policies and programs that engage youth in City governance through opportunities such as internships and having youth representatives on public bodies.

P18.10 Noticing

Support policies and programs to review and update the City's noticing requirements and consider the use of websites, automatic telephone calling systems, email distribution lists, text messaging and other innovative features to provide better access to information.

P18.11 Media

Support policies standardizing the issuance of press releases for major planning efforts and development projects in order to provide information to the Fullerton community and to encourage community involvement at workshops and hearings.

P18.11.1 Fire Hazard Avoidance

Support fire prevention, public education, early detection programs, and property inspections to identify and avoid fire hazards.

A18.11.1(a)

Educate residents (with special attention to at risk populations) and businesses on the City's vegetation management practices, including fire safety, landscaping installation and maintenance, defensible space, and other fire hazard reduction strategies.

Neighborhood/District Level

P18.12 Neighborhood Organizations and HOAs

Support policies and programs that encourage neighborhood involvement by engaging neighborhood organizations and homeowner associations (HOAs) in projects affecting their particular area.

P18.13 Self Reliance

Support policies programs and regulations that strengthen the efforts of neighborhoods and districts to become self-reliant when it comes to solving area problems.

P18.14 Convenient Meetings

Support policies, projects, programs, and regulations that uphold the scheduling of community meetings at locations and times convenient for community members desiring to provide input.

Project Level

P18.15 Early Notification Opportunities

Support policies, programs and regulations that maximize opportunities for early notification of proposed projects, or projects/issues under consideration, using the most current technologies as they become available.

GOAL 19:

An adequate, safe, and reliable water supply.

Region/Subregion Level

P19.1 Agency Coordination for Water Supplies

Support regional and subregional efforts to ensure that an adequate water supply, including groundwater, remains available.

P19.1.1 Adequate Infrastructure and Capacity

Ensure existing development in areas with sufficient water supply infrastructure and roadway capacity maintain adequate evacuation and emergency equipment access so as not to degrade as a result of new development.

P19.2 Conservation Efforts

Support regional and subregional efforts to promote water efficiency and conservation.

P19.3 New Technologies

Support projects, programs, policies and regulations to encourage the use of new technologies which reduce water use.

P19.3.1 Regional Water Protection*

Support regional and subregional efforts to safeguard water infrastructure and supply against the treats of contamination or disruption from disaster events of a regional or national scale, such as terrorism, earthquakes, floods, geologic activity, or other events as they arise.

P19.3.2 Climate Resilience in Water Supply*

Support regional and subregional efforts to adapt current water supply practices in anticipation of reduced water availability due to the effects of climate change.

City Level

P19.4 Adequate Supply

Support projects, programs, policies and regulations to maintain adequate quantities of water, including groundwater, available to the City now and in the future.

P19.4.1 Water Provider Coordination

Coordinate with water providers to maintain and enhance water supply infrastructure to ensure adequate supplies for existing and future daily demands and firefighting suppression requirements.

P19.5 Water Quality

Support projects, programs, policies and regulations to ensure the quality of the water supply.

P19.5.1 Water-saving Infrastructure*

Support projects, programs, policies, and regulations that will lead to the capture, storage, and re-use of rainwater in the city so as to reduce Fullerton's dependence on external sources of water.

Neighborhood/District Level

P19.6 Focus Area Planning

Support projects, programs, policies and regulations to evaluate ways to conserve and reduce water use as part of community-based planning of Focus Areas.

Project Level

P19.7 Sustainable Water Practices in New Development

Support projects, programs, policies and regulations to encourage water efficient practices in site and building design for private and public projects.

GOAL 20:

A healthy watershed and clean urban runoff.

Region/Subregion Level

P20.1 Regional Watersheds

Support regional and subregional efforts to support functional and healthy watersheds.

P20.2 Urban Runoff Management

Support regional and subregional efforts to support cleaner and reduced urban runoff.

City Level

P20.3 Product Handling and Disposal Impacts

Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff from the improper handling and disposal of commercial products.

P20.3.1 Natural Water System Integrity*

Support projects, programs, policies and regulations that encourage the re-emergence of natural watersheds throughout the city's extent.

Neighborhood/District Level

P20.4 Local Watersheds

Support projects, programs, policies and regulations that support a functional and healthy watershed within neighborhoods and districts.

P20.5 Water Quality of Focus Areas

Support projects, programs, policies and regulations to encourage site and infrastructure improvements within the City's Focus Areas to support cleaner and reduced urban runoff.

Project Level

P20.6 Construction Impacts

Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by private and public construction projects.

P20.7 Development Impacts

Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by the design or operation of a site or use.

P20.7.1 Incorporate Natural Water Systems in Design Standards*

Support projects, programs, policies and regulations that encourage the preservation of natural creeks and waterways into new projects and developments in Fullerton.

P20.7.2 Impact of New Development

To the greatest extent feasible, require that all new development and major redevelopment activities, do not impact natural drainage or increase stormflows off the proposed project site.

GOAL 24:

Responsible management of open spaces balanced with the healthy functioning of environmental systems.

Region/Subregion Level

P24.1 Management and Maintenance

Support projects, programs and policies to coordinate with existing regional park districts, the private sector and nonprofit institutions to manage and maintain regional open spaces.

P24.2 Land Trusts

Support projects, programs and policies to encourage the establishment of land trusts to help preserve significant open space within the region.

City Level

P24.3 Access and Use of Open Space

Support projects, programs, policies and regulations to increase access to and use of open space resources while respecting the natural environment.

P24.4 Accessibility for All

Support projects, programs, policies and regulations to ensure that, when natural topography allows, public open spaces are accessible to people of all abilities.

P24.5 Long-Range Needs

Support projects, programs, policies and regulations to preserve areas of open space sufficient to meet the long-range needs of the City.

P24.6 Watershed Management

Support projects, programs, policies and regulations to manage open space watersheds to limit potential fire, flood, and erosion hazards.

P24.7 New Open Space

Support projects, programs, policies and regulations to create open space as funding and other opportunities become available.

P24.8 Open Space Maintenance

Ensure open space brush areas, susceptible to wildfire risk, are adequately maintained in accordance with the California Fire Code and local adopted ordinances.

GOAL 26:

Protection of people, natural and built environments and economy from natural hazards.

Region/Subregion Level

P26.1 Regional Coordination

Support projects, programs, policies and regulations to coordinate planning for and response to natural disasters with other agencies within the region.

P26.1.1 Mutual Aid

Encourage regional partnerships and mutual aid agreements between the City and other agencies/entities, further strengthening emergency response capabilities within the City and region.

City Level

P26.2 Adequate Emergency Response Infrastructure

Support projects, programs, policies and regulations to prepare to respond to natural disasters to the best of the City's ability.

P26.2.1 Continual Efforts*

Support projects, programs, policies and regulations to continually update and refine the City's Safety Element, Local Hazard Mitigation Plan, Emergency Operations Plan, and other plans as staff may deem relevant with the latest available information on hazards and disaster risk in Fullerton.

P26.2.2 Reduce Development Risk

Encourage new development outside of the very high fire hazard severity zone. If development is proposed in the very high fire hazard severity zone, require fire safe design (including but not limited to; defensible space and home hardening) and compliance with fire safe regulations, adopted CFC, and local ordinances.

Neighborhood/District Level

P26.3 Focus Area Planning

Support projects, programs, policies and regulations to consider natural hazard risks and mitigation as part of community-based planning of Focus Areas.

P26.3.1 Community Hazard Mapping*

Support projects, programs, policies and regulations that help communities and residents of neighborhood blocks understand what kinds of hazards could occur in their area and which areas are the most susceptible to fire, geologic, seismic, and flooding hazards

P26.3.2 Public Availability of Mapping

Update mapping for natural hazards as new data becomes available. Ensure that the most current version of the mapping is made available in public outreach materials.

Project Level

P26.4 Minimization of Development in High Risk Areas

Support projects, programs, policies and regulations to discourage or limit development within areas that are vulnerable to natural disasters, particularly in areas with recurring damage and/or the presence of multiple natural hazards.

P26.5 Hazard Specific Development Regulations

Support projects, programs, policies and regulations to utilize hazard specific development regulations to mitigate risks associated with identified potential natural hazards, including flooding, wildland fires, liquefaction, and landslides when development does occur.

P26.6 Enhance Fire Protection

Require new development to incorporate design measures that enhance fire protection in areas of elevated fire risk (including the WUI and Fire Hazard Severity Zones). This shall include but is not limited to the incorporation of fire-resistant structural design, use of fire-resistant landscaping, home hardening, defensible space and vegetation management around the perimeter of structures.

GOAL 26 (a):

A community prepared for future climate related impacts.

P26.7 Collaborate on Resilience

Collaborate with local, regional, state, and/or federal jurisdictions and agencies on climate resiliency and adaptation strategies in the City.

P26.8 Monitor Changes

Monitor climate change-related effects with local, regional, state, and/or federal partners to provide information about the effectiveness of existing infrastructure and programs within the City.

P26.9 Monitor Indicators

Coordinate with regional, state, and federal agencies to monitor the indicators and impacts of climate change as they relate to the City.

P26.10 Update City Plans

Monitor and periodically update the Fullerton Climate Action Plan, The Fullerton Green Project, Sustainable Fullerton, and the Fullerton Local Hazard Mitigation Plan as required to include the most up to date climate adaptation mapping and information.

Attachment No. 2

Public Comments

From: [REDACTED]
To: [Chris Schaefer](#)
Subject: [EXTERNAL MAIL]Comments on the Draft Public Safety Element
Date: Tuesday, December 31, 2024 10:18:13 PM
Attachments: [NFPA 1710 Fact Sheet.pdf](#)

CAUTION: BE CAREFUL WITH THIS MESSAGE

This email came from outside City of Fullerton. Do not open attachments, click on links, or respond unless you expected this message and recognize the email address.

Jane Reifer

December 31, 2024

Chris Schaefer, AICP, Planning Manager
City of Fullerton Community and Economic Development
303 W. Commonwealth Ave.
Fullerton, CA 92832-1775

Subject: Comments on the Draft Public Safety Element

Dear Mr. Schaefer,

I appreciate the opportunity to provide feedback on the Draft Public Safety Element of the Fullerton General Plan. Since there was no time stated, I'm assuming it's acceptable to be submitting these comments up until midnight of December 31st. These comments will assume not just the City's current population, but the population induced by the city's General Plan (the "Fullerton Plan") buildout and our new RHNA requirements of 13,209 housing units which exceed our 2012 General Plan's stated buildout numbers. Below, I outline several concerns, omissions, and inconsistencies within the current draft that should be addressed to enhance public safety and align policies with measurable and enforceable standards. This letter includes an introduction summarizing key issues, a goal-by-goal evaluation with current and proposed language, a rationale for each proposed change, and a summary table categorizing goals by deficiencies in metrics, time periods, or enforcement mechanisms.

I would like to request again that all City document revisions, updates, and drafts include redlining of comments. It is a courtesy to the public and decisionmakers to include this format so distinctions between old and new can easily be made. The Goals section of the revision did include some distinctions as to which were new goals, but there was no basic original document included. It was a little confusing with no redlined, change-tracking format, to understand how revisions affect the base document, since there are several aspects to the Public Safety Element due to this information on page 71 of the actual, current Public Safety Element: The City of Fullerton Local Hazard Mitigation Plan (LHMP) has been adopted as part of The Fullerton Plan Safety Element. The Safety Element is divided into two chapters of The Fullerton Plan: Natural Hazards (Chapter 21) [sic] and Public Safety (Chapter 10) with additional policies in Public Health (Chapter 11), Water (Chapter 16), Air Quality and Climate Change (Chapter 17), Integrated Waste Management (Chapter 18), and Natural Hazards (Chapter 20).

It would also be helpful to include links to a list of highly relevant documents (in this case, the original Public Safety Element (<https://www.cityoffullerton.com/home/showpublisheddocument/1051/637436165080870000>), the Natural Hazards Element, the Local Hazard Mitigation Plan, The Emergency Operations Plan, the Fullerton Plan Final EIR, the Orange County and Orange County Fire Authority Local Hazard Mitigation Plan (<https://www.ocsheriff.gov/commands-divisions/investigations-special-operations-command/emergency-management/hazard-mitigation>), and the Orange County Transportation Authority (OCTA) Hazard Mitigation Plan (<https://www.octa.net/programs-projects/programs/plans-and-studies/completed-studies/hazard-mitigation-plan/>).

I did not have time to correlate all suggestions to the goals proposed, so additional miscellaneous comments will appear at the end.

Introduction

The Revised Safety Element demonstrates the City's commitment to public safety but contains several areas requiring clarification and improvement. Key issues identified include:

1. **Undefined Metrics:** Terms like "Adequate," "high level," and "meets current and future demand" lack objective definitions, leading to potential inconsistencies.
2. **Undefined Time Periods:** Goals referencing evaluations, assessments, or updates (e.g., "regularly" or "periodically") fail to specify maximum intervals.
3. **Enforcement Mechanisms:** Many goals are aspirational and lack actionable steps or consequences for non-compliance.

Definition of "Adequate"

Adequate: The term "Adequate" shall be defined as meeting established performance standards for emergency services, including response times, incident counts, and other relevant metrics aligned with NFPA 1710 for fire services, IACP benchmarks for police, and infrastructure sufficiency to maintain service levels. Infrastructure and services shall be presumed inadequate until demonstrated otherwise through formal evaluation and compliance with these standards.

Definition of "Monitoring"

Monitoring: The term "Monitoring" means the continuous, real-time evaluation of emergency services performance and infrastructure capacity through dispatch data and other relevant systems to ensure compliance with Adequate standards. Monitoring shall inform

hazard mitigation strategies and support dynamic adjustments to maintain public safety.

Goal-by-Goal Evaluation with Proposed Revisions and Rationale

P7.1 Balanced Decision Making

- **Current Language:** Require that all new development and major redevelopment have adequate infrastructure in place to support daily demands and emergency response capabilities.
- **Proposed Language:** Require that all new development and major redevelopment demonstrate Adequate infrastructure as defined above to support daily demands and emergency response capabilities.
- **Rationale:** This revision clarifies that infrastructure must meet objective adequacy standards before projects proceed, ensuring that public safety is not compromised.

A7.1(a)

- **Current Language:** Develop a program which evaluates the emergency infrastructure capabilities of potential development sites prior to issuance of construction permits.
- **Proposed Language:** Develop and implement a program that requires the actual evaluation of emergency services adequacy for potential development sites. No project applications may be approved unless services are demonstrated to be Adequate as defined above.
- **Rationale:** Ensures that evaluation of adequacy is not limited to program creation but mandates actionable assessments before project approval.

P7.2 Housing Growth

- **Current Language:** Require that all new development and major redevelopment be located in areas previously identified as having adequate infrastructure capacity to accommodate future housing requirements.
- **Proposed Language:** Require that all new development and major redevelopment demonstrate Adequate infrastructure capacity as defined above, assessed within 12 months prior to permit application, to support future housing requirements.
- **Rationale:** Introduces a time frame for assessments, ensuring infrastructure evaluations reflect current conditions and demands.

P7.2.1 Adequate Infrastructure

- **Current Language:** Require that new development and major redevelopment are appropriate in scale to current and planned infrastructure capabilities, if not, require infrastructure upgrades are completed prior to issuance of certificate of occupancy.
- **Proposed Language:** Require that new development and major redevelopment are appropriate and are placed in areas with Adequate infrastructure capabilities. If not, require infrastructure upgrades are completed prior to issuance of certificate of occupancy.
- **Rationale:** Makes use of the defined term "Adequate." While developers are not required to pay for upgrades under Propositions 218 and 26, they may choose to do so if their development is in an area with inadequate public safety infrastructure. Aligns developer contributions with legal constraints while ensuring infrastructure adequacy is not compromised.

P7.3 Infrastructure Planning

- **Current Language:** Ensure infrastructure meets current and future daily demands and fire flow requirements while still meeting desired neighborhood/district character.
- **Proposed Language:** Ensure emergency services and infrastructure are Adequate as defined above to meet current and future demands while maintaining neighborhood/district character.
- **Rationale:** Standardizes the use of "Adequate" as defined, improving clarity and consistency across goals.

P12.4.2 Fire Regulations

- **Current Language:** Regularly re-evaluate specific fire hazard areas to determine the effectiveness of existing hazard mitigation strategies.
- **Proposed Language:** Use Monitoring as described above to determine the effectiveness of existing hazard mitigation strategies.
- **Rationale:** Continuous Monitoring allows for dynamic adjustments to hazard mitigation, ensuring proactive rather than reactive safety measures.

P12.12.1 Emergency Response Capability

- **Current Language:** Maintain a high level of emergency response capability.
- **Proposed Language:** Maintain Adequate emergency response capability.
- **Rationale:** Provides an objective standard for evaluating emergency response capabilities.

P13 Transparency in Metrics

- **Current Language:** None.
- **Proposed Language:** Develop and implement real-time metrics updates through data streams provided by dispatch systems. Metrics must be publicly accessible in real-time to ensure transparency and continuous improvement.
- **Rationale:** Real-time metrics enhance public accountability and facilitate continuous system improvements.

P13.11 Essential Facilities Location

- **Current Language:** Ensure new public/critical facilities (schools, hospitals, fire stations, etc.) are not located in Fire Hazard Severity Zones to the greatest extent feasible. If located in these areas, ensure full compliance with California Fire Code and local ordinance and adequate fire response and evacuation capabilities are available.

- **Proposed Language:** Ensure new public/critical facilities (schools, hospitals, fire stations, etc.) are not located in Fire Hazard Severity Zones to the greatest extent feasible. If located in these areas, ensure full compliance with California Fire Code and local ordinance and adequate fire response and evacuation capabilities are available. Further ensure that facility upgrades and placement of new facilities respects existing and future historic designations.
- **Rationale:** Adds protection for historic facilities while public safety measures are met.

Summary

The purpose of these recommendations is to ensure that Fullerton remains a safer city by implementing metrics that are presumed inadequate until proven otherwise. Immediate funding for real-time metric monitoring systems is urged.

Additional Recommendations

1 - List of Goals Requiring Future Actions:

Goals that call for evaluations, assessments, or program implementation should be clearly identified and tracked.

2 - Enforceability of Goals:

Enact ordinances and allocate funding to operationalize goals.

3 - Wildfire Preparedness:

Extend fire-resistant construction and landscaping standards citywide.

4 - Communications Inclusion:

To include all communities in emergency communications special efforts should be made to include renters who often don't receive notices that go to property owners. Please see my several submissions on this in the past.

5 - Dam Inundation Issues:

Fullerton's Brea Saddle Dike Dam and Brea's 30 MG Central Reservoir don't seem to be mentioned in the LHMP but the City is definitely in the inundation zone for these two. Here are 3 snippets from articles:

Brea Dam Overtopping

On February 22, 2005, the Brea Dam failed following a large rain storm. An extended period of very wet weather dumped more than 6.8 inches.....The dam was overtopped, flooding the Fullerton Golf Course and Bastanchury Road.

Prado Dam rated a 'high urgency' risk after spillway problems discovered

Federal officials are working urgently to strengthen the spillway at Prado Dam near Corona to prevent it from failing in a major flood, which could imperil hundreds of thousands of people living downstream in Orange County. After a May inspection determined the dam's spillway could perform poorly in a major flood, the dam's risk rating was changed from "moderate urgency" to "high urgency." Dena O'Dell, a U.S. Army Corps of Engineers spokeswoman, said Thursday, May 16, that the agency is taking immediate measures to reduce the risk that the spillway will fail. And she said the agency was preparing to launch a project in 2021 to bolster the spillway and raise it 20 feet.....

Prado Dam Forecast Informed Reservoir Operations Preliminary Viability Assessment. UC San Diego.

Ralph, F. M., Woodside, G., Anderson, M., Cleary-Rose, K., Haynes, A., Jasperse, J., Sweeten, J., Talbot, C., Tyler, J., Vermaelen, R. (2021). Retrieved from <https://escholarship.org/uc/item/13091539>

2.6.1 Existing Spillway at Elevation 543 Feet

.....an updated independent analysis of the existing conditions at Prado Dam and Reservoir (i.e., raised embankment, new outlet works, unraised spillway) must be completed to assess the level of protection this project can provide at present. In addition, the existing spillway has structural deficiencies that were identified during the dam safety assessment in October 2019. Discharge from the dam, as the reservoir elevation rises toward the existing spillway crest, may be maximized up to 30,000 cfs to prevent spillway flow, or to limit its magnitude and duration. Currently, USACE is working to have an interim risk reduction measure in place to address the existing spillway deficiencies.

Although it seems as though the increase in urgency designation may have been due to the large potential population impact rather than actual safety risk, the intensity of atmospheric rivers seems to be increasing, and warrants a few phone calls e-mails to the several dam operators (ACE, OCWD) for current status. It is unclear whether the local warning system was ever activated. Dam alert information in old dam control manuals do not seem to be updated. Lastly, where the report lists "Exhibit 29 Dam Inundation Risks in The Fullerton Plan (page 213)", the link is missing.

6 - Other Waterway Risks:

Fullerton Creek, a major Fullerton waterway is missing from most of the maps. Tri-City Park does not seem to be included with its large water features. The 9-acre Placentia Retarding Basin just outside the city limits is not on all maps although several other basins farther outside the City are listed. Other water features just outside the city that are not always noted: Lakeside Lake – 8 acres, Ralph Clark Park Lake – 3 acres, Raymond Basin -19 acres, Orange County Reservoir, Humble Reservoir.

7 - Evacuation Constraints:

Address constrained evacuation routes through specific policies, such as widening roadways or improving access points.

8 - Better Evacuation Planning Needed for Limited Mobility Populations:

People needing emergency evacuations include non-driving populations: youth, poor, elderly blind or disabled, non-car owning, suspended licenses. These are actually a significant part of the population and unique plans need to be devised to accommodate them in emergencies. Constrained roadways and parcel groups of concern are highlighted but don't call out these populations. Perhaps census areas where people don't own cars can be added. The City should partner with OCTA well in advance of any emergency to make sure that solutions for these populations are robust and Adequate. General Plan Fair Share Policy P514 should

be enhanced so bus, bike and pedestrian facilities are Adequate.

Transportation systems on p. 27 do not mention bus, rail bike and pedestrian and shared ride service (Lyft, Uber) transportation at all.

P 15 of the Climate Vulnerability Assessment mentions transportation systems assuming most people will evacuate by arterial highways. It does mention OCTA buses but provides no plan or reference to a plan for OCTA's service during emergencies or bus strikes. It also neglects to mention the City's 2 major bus stations – the Fullerton Transportation Center (FTC) and the Fullerton Park n Ride. The city's 2 taxi stands at FTC and possibly still at the Marriot Hotel are not referenced. Neither is there a map showing bus routes by weekday, Saturdays, and Sundays + holidays which have different spans of service. shared ride service (Lyft, Uber) is not mentioned but are a lifeline for many without cars. Bike routes and sidewalk shortfalls are also not addressed.

CW-7 should be enhanced to include non-driving populations:

CW-7: Coordinate with regional and local transportation and transit agencies to ensure continued access and movement in the event of an emergency.

- Coordinate with Caltrans and Orange County Transit Authority to assess the vulnerability of transportation infrastructure and primary evacuation routes to hazardous climate-related events

9 - Weather Extremes:

Cold weather shelters should be addressed. EH-2 should be enhanced to add trees and other cooling elements to vulnerable communities: EH-2: Develop facilities and resources to reduce the effects from extreme heat events

10 - Police and Fire Response Times:

Taller buildings increase police and fire response time as well as add to cost. A full discussion of this should be done. My understanding from Appendix D during the HIOZ process was that the City's fire response times are already below Adequate. Attached to this e-mail is a summary of NFPA 1710.

11 – Asbestos and Lead:

I would like to see a policy regulating Police and Fire use of buildings with Asbestos-Containing Materials (ACM) and Lead-Containing Materials (LCM) that currently are used as practice areas with no guidelines for remediation. These often cause an unintentional violation of environmental mitigations. Also, a program should call out the asbestos siding on many historic-age houses and possibly provide assistance with safe removal.

12 - Sewer and Industrial Wastewater Issues:

Would like to see Sewer called out in the Lifeline Utilities section rather than embedded in the Water section. OC Sanitation's cooperation in this, as well as wastewater.

13 - Oil Spills and Pipelines:

Please address oil spills and pipeline disruptions more clearly, not just oil and gas pipelines but also industrial wastewater and sewer. P. 16 mentions no major pipelines through Fullerton, but I don't believe that's the case.

14 - Water Quality Issues:

Much of Fullerton in is a toxic plume area. This should be highlighted as there could be additional groundwater threats and drinking water contaminants.

15 - Sensitive Receptors:

Please address the situation that the new Housing Incentive Overlay Zone will now have residential units with sensitive receptors much closer to industrial pollution. Please see my other comments on this issue. Please add a goal mandating Health Risk Assessments for sensitive receptors as appropriate. City environmental documents often skip this requirement.

16 - Tree Risks:

Address tree falling risk safety as a part of the Safety Element. Current "topping" practices and watering the base of trunks have increased this risk in the past decade.

17 - Natural Resources Impacts:

p. 29 Natural Resource areas – Impact on Fullerton's unusual array of native bees and pollinators should be added.

18 - Rail Inclusion:

Hazardous material risk on. P 16 should include rail and rail lines should be added to all areas of the document discussing hazardous materials transportation.

19 - Air Safety:

Address the major increase that helicopter commuting services will have on public safety.

20 - Fireworks:

It would be helpful to mention the City's fireworks restrictions in this document.

Conclusion

While the Revised Safety Element includes commendable goals and policies, addressing the issues outlined above will significantly enhance its effectiveness. Defining metrics, clarifying ambiguities, and ensuring enforceability are critical steps to achieving meaningful public safety improvements. I urge the City to incorporate these recommendations into the final Safety Element.

Thank you for your consideration. I am available to discuss these comments further at your convenience.

Sincerely,

Jane Reifer



Attachment No. 3

Responses to Public Comments

The following comments received on the Fullerton General Plan Safety Element have been reviewed by staff and responses/ suggestions have been identified for Planning Commission / City Council review and direction.

Comment Provided	City Response
<p>Undefined Metrics: Terms like "Adequate," "high level," and "meets current and future demand" lack objective definitions, leading to potential inconsistencies.</p> <p>2. Undefined Time Periods: Goals referencing evaluations, assessments, or updates (e.g., "regularly" or "periodically") fail to specify maximum intervals.</p> <p>3. Enforcement Mechanisms: Many goals are aspirational and lack actionable steps or consequences for non-compliance.</p>	<p>Regarding the definition for Adequate – see below</p> <p>Regarding the definition for Monitoring – see below</p> <p>Regarding enforcement mechanisms, the commenter indicates that many of the goals are aspirational. That is by design. This is a long term document that is typically looking out 20 years to guide future development. Goals are typically very high level, while policies, and actions provide more detail and clarity on community priorities. All of the information from the general plan typically supports the regulations and standards located in the City' Municipal Code, which is the set of rules and regulations that are used by the City to determine compliance and potential consequences associated with non-compliance.</p>
<p>Commenter requested a definition for the term Adequate. The definition provided below was suggested:</p> <p>The term "Adequate" shall be defined as meeting established performance standards for emergency services, including response times, incident counts, and other relevant metrics aligned with NFPA 1710 for fire services, IACP benchmarks for police, and infrastructure sufficiency to maintain service levels. Infrastructure and services shall be presumed inadequate until demonstrated otherwise through formal evaluation and compliance with these standards.</p>	<p>While this definition seems appropriate, applying this definition in a general plan document may not be appropriate. Determining the adequacy of city services or infrastructure capacity should rely on objective criteria and processes, however these should exist outside of the general plan as City standards, protocols, and best practices. Incorporate these types of standards into a general is a level of detail that is outside the normal scope for this type of policy document and could impact City staff's ability to effectively address community needs. General Plans are typically long term documents that should not include data and information that needs to frequently updated. Inclusion of this type of data/ information would increase City staff workload unnecessarily.</p>
<p>Commenter requested a definition for the term Monitoring. The definition provided below was suggested:</p>	<p>While this definition seems appropriate, applying this definition in a general plan document may not be appropriate. Real time evaluation or emergency services performance and infrastructure capacity is generally best suited for dynamic documents like annual budgets/workplans, strategic department plans,</p>

<p>The term “Monitoring” means the continuous, real-time evaluation of emergency services performance and infrastructure capacity through dispatch data and other relevant systems to ensure compliance with Adequate standards. Monitoring shall inform hazard mitigation strategies and support dynamic adjustments to maintain public safety.</p>	<p>or master plans that are not governed by General Plan requirements. General Plans are typically long term documents that should not include data and information that needs to frequently updated. Inclusion of this type of data/ information would increase City staff workload unnecessarily.</p>
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In addition to the general comments, the following comments on goals and policies were provided:

General Plan Goal	Current Language	Proposed Language / Rationale	City Response
<p>P7.1, Balanced Decision Making</p>	<p>Require that all new development and major redevelopment have adequate infrastructure in place to support daily demands and emergency response capabilities.</p>	<p>Require that all new development and major redevelopment demonstrate Adequate infrastructure as defined above to support daily demands and emergency response capabilities.</p> <p><i>This revision clarifies that infrastructure must meet objective adequacy standards before projects proceed, ensuring that public safety is not compromised.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE.</p> <p>The modified language proposed relies on a definition that would need to be approved by City Council. While the current language allows for the same result, there is flexibility in what the City deems adequate with this language versus the proposed language.</p>

General Plan Goal	Current Language	Proposed Language / <i>Rationale</i>	City Response
A7.1(a)	Develop a program which evaluates the emergency infrastructure capabilities of potential development sites prior to issuance of construction permits.	<p>Develop and implement a program that requires the actual evaluation of emergency services adequacy for potential development sites. No project applications may be approved unless services are demonstrated to be Adequate as defined above.</p> <p><i>Ensures that evaluation of adequacy is not limited to program creation but mandates actionable assessments before project approval.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE.</p> <p>The language proposed could create inconsistencies or potential conflicts with other goals, policies, and actions. Policy P7.1 already requires that all new developments and major redevelopments have adequate infrastructure in place. This action as originally written triggers the assessment of infrastructure prior to issuance of construction permits.</p>
P7.2, Housing Growth	Require that all new development and major redevelopment be located in areas previously identified as having adequate infrastructure capacity to accommodate future housing requirements.	<p>Require that all new development and major redevelopment demonstrate Adequate infrastructure capacity as defined above, assessed within 12 months prior to permit application, to support future housing requirements.</p> <p><i>Introduces a time frame for assessments, ensuring infrastructure evaluations reflect current conditions and demands.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE.</p> <p>See City Response 1 (above). Given that any significant (re)development may take several years to build, it should be adequate to show that any needed infrastructure or service expansion can be budgeted and carried out during the construction phase of the (re)development.</p> <p>It's unlikely that any City area will have plentiful excess infrastructure or service capacity to support development five to ten years hence.</p>

General Plan Goal	Current Language	Proposed Language / <i>Rationale</i>	City Response
P7.2.1, Adequate Infrastructure	Require that new development and major redevelopment are appropriate in scale to current and planned infrastructure capabilities, if not, require infrastructure upgrades are completed prior to issuance of certificate of occupancy.	<p>Require that new development and major redevelopment are appropriate and are placed in areas with Adequate infrastructure capabilities. If not, require infrastructure upgrades are completed prior to issuance of certificate of occupancy.</p> <p><i>Makes use of the defined term "Adequate." While developers are not required to pay for upgrades under Propositions 218 and 26, they may choose to do so if their development is in an area with inadequate public safety infrastructure. Aligns developer contributions with legal constraints while ensuring infrastructure adequacy is not compromised.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE.</p> <p>Requiring infrastructure or service upgrades to be completed prior to issuing certificates of occupancy is more realistic than requiring them to be finished before issuing building permits. However, using the proposed definition of "adequate" limits development to areas that already have excess capacity, which is unlikely to be found.</p>
P7.3, Infrastructure Planning	Ensure infrastructure meets current and future daily demands and fire flow requirements while still meeting desired neighborhood/district character.	<p>Ensure emergency services and infrastructure are Adequate as defined above to meet current and future demands while maintaining neighborhood/district character.</p> <p><i>Standardizes the use of "Adequate" as defined, improving clarity and consistency across goals.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE.</p> <p>See City Response 1 (above). The proposed definition of "adequate" is backward-looking and does not take into account changes in conditions, standards, technology, or capabilities.</p>

General Plan Goal	Current Language	Proposed Language / <i>Rationale</i>	City Response
P12.4.2, Fire Regulations	Regularly re-evaluate specific fire hazard areas to determine the effectiveness of existing hazard mitigation strategies.	<p>Use Monitoring as described above to determine the effectiveness of existing hazard mitigation strategies.</p> <p><i>Continuous Monitoring allows for dynamic adjustments to hazard mitigation, ensuring proactive rather than reactive safety measures.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE.</p> <p>Incorporating monitoring into this policy would not be appropriate as that term is typically reserved for an action. If City Council would like to create an action regarding monitoring this could be incorporated into the element, if desired.</p>
P12.12.1, Emergency Response Capability	Maintain a high level of emergency response capability.	<p>Maintain Adequate emergency response capability.</p> <p><i>Provides an objective standard for evaluating emergency response capabilities.</i></p>	<p>This policy language has been reviewed and approved by Cal FIRE. Modifications to the language can be undertaken by City Council if deemed necessary or desired.</p>
P13, Transparency in Metrics	None	<p>Develop and implement real-time metrics updates through data streams provided by dispatch systems. Metrics must be publicly accessible in real-time to ensure transparency and continuous improvement.</p> <p><i>Real-time metrics enhance public accountability and facilitate continuous system improvements.</i></p>	<p>This proposal severely overestimates the amount of data available from dispatch systems, as well as their ability to produce in real time data that's meaningful to the public at large.</p> <p>In addition, this type of data and information is not appropriate for a planning document that supports community development over a long time horizon (20 years). A more appropriate location for this type of information would be Department Strategic Plans/ Work Programs.</p>

General Plan Goal	Current Language	Proposed Language / <i>Rationale</i>	City Response
P13.11, Essential Facilities Location	Ensure new public/critical facilities (schools, hospitals, fire stations, etc.) are not located in Fire Hazard Severity Zones to the greatest extent feasible. If located in these areas, ensure full compliance with California Fire Code and local ordinance and adequate fire response and evacuation capabilities are available.	<p>Ensure new public/critical facilities (schools, hospitals, fire stations, etc.) are not located in Fire Hazard Severity Zones to the greatest extent feasible. If located in these areas, ensure full compliance with California Fire Code and local ordinance and adequate fire response and evacuation capabilities are available. Further ensure that facility upgrades and placement of new facilities respects existing and future historic designations.</p> <p><i>Adds protection for historic facilities while public safety measures are met.</i></p>	The intent of this policy is to ensure new City facilities are located outside of high hazard areas wherever feasible. The policy proposed has been reviewed and approved by Cal FIRE and the additional language proposed does not enhance this policy. Inclusion of this language could further complicate the City's ability to effectively site new facilities and introduces a requirement that may already be addressed by existing city policies and regulations in Chapter 1 of the Fullerton Plan.

Additional Recommendations

Recommendation Title	Comment	City Response
1. List of Goals Requiring Future Actions	Goals that call for evaluations, assessments, or program implementation should be clearly identified and tracked.	The City relies on the General Plan Implementation Program to monitor goals, policies, and actions. This program allows City staff to set priorities, monitor implementation progress, and develop annual work programs and the necessary budgets to implement the actions out of the general plan.
2. Enforceability of Goals	Enact ordinances and allocate funding to operationalize goals.	Based on the goals, policies, and actions adopted in the General Plan, the City Council has the ability to decide which priorities received funding and staff support as part of their annual budgeting process.
3. Wildfire Preparedness	Extend fire-resistant construction and landscaping standards citywide.	At this time fire resistant construction is regulated by the presence of very high fire hazard severity zones and the requirements associated with that designation. If desired, the City can expand the application of these requirements, but this would require action by the City Council.
4. Communications Inclusion	To include all communities in emergency communications special efforts should be made to include renters who often don't receive notices that go to property owners. Please see my several submissions on this in the past.	The City relies on assessor parcel information for the mailing of notices to property owners. In addition, residents that do not own their homes have the ability to request notification by the City, but this is a voluntary process, as it is not possible to obtain information for all residents within the city relying on the available information provided by the County assessor.

Recommendation Title	Comment	City Response
5. Dam Inundation Issues	<p>Fullerton’s Brea Saddle Dike Dam and Brea’s 30 MG Central Reservoir don’t seem to be mentioned in the LHMP but the City is definitely in the inundation zone for these two...Although it seems as though the increase in urgency designation may have been due to the large potential population impact rather than actual safety risk, the intensity of atmospheric rivers seems to be increasing, and warrants a few phone calls e-mails to the several dam operators (ACE, OCWD) for current status. It is unclear whether the local warning system was ever activated. Dam alert information in old dam control manuals do not seem to be updated. Lastly, where the report lists “Exhibit 29 Dam Inundation Risks in The Fullerton Plan (page 213)”, the link is missing.</p>	<p>Figure 4-2 identifies the critical facilities located in relation to the dam inundation zones for Fullerton Dam, Prado Dam, Carbon Canyon Dam, Orange County Reservoir, and Brea Dam. In addition, Tables 4-4 through 4-8 identify the potential facilities affected by these dams. The only dam that does not affect the City based on this analysis is the Orange County Reservoir. Any other dams located within the City may not meet the requirements for dam inundation mapping, which may be the reason it was not analyzed. In addition, the City regularly coordinates with dam owners/operators to ensure the latest information is available to City staff/departments.</p> <p>Regarding the broken hyperlink, City staff will look into this issue and correct it, if necessary.</p>
6. Other Waterway Risks	<p>Fullerton Creek, a major Fullerton waterway is missing from most of the maps. Tri-City Park does not seem to be included with its large water features. The 9-acre Placentia Retarding Basin just outside the city limits is not on all maps although several other basins farther outside the City are listed. Other water features just outside the city that are not always noted: Lakeside Lake – 8 acres, Ralph Clark Park Lake – 3 acres, Raymond Basin -19 acres, Orange County Reservoir, Humble Reservoir.</p>	<p>A majority of the maps in Appendix I relied on the same base map, which relies on readily available GIS layers from federal, state, and local sources. The City did not modify these base map layers. If these additional water features are deemed necessary to map for the Safety Element, the City Council can direct staff to conduct this additional work, which may result in additional costs associated with the project. The addition of these features would not change any of the discussion and analysis within the element or warrant new or modified policies.</p>

Recommendation Title	Comment	City Response
7. Evacuation Constraints	Address constrained evacuation routes through specific policies, such as widening roadways or improving access points.	<p>The goals, policies, and actions addressing evacuation have been reviewed and approved by Cal Fire staff and the California Board of Forestry. The main policy and related action that address the commenters' concern is Policy 13.5.5 and Action 13.5.5(a), provided below. In addition, several other policies (listed below) were developed to ensure the City could address evacuation constraints to the best of their ability.</p> <p>P13.5.5 Maintain Adequate Access Ensure existing development in areas with sufficient water supply infrastructure and roadway capacity to maintain adequate evacuation and emergency equipment access do not degrade as a result of new development.</p> <p>A13.5.5(a) Identify the feasibility of constructing additional emergency access improvements for existing developments that do not meet minimum road standards for emergency equipment, such as:</p> <ul style="list-style-type: none"> • Additional vehicle pullouts at key hillside locations. • Limiting or restricting on-street parking at key hillside locations. • Potential for construction of new or improved emergency access routes. • Roadside clearance improvements. <p>P13.5.1 Effective Evacuation P13.5.2 Minimum Emergency Access Points P13.5.3 Functionality in Hazardous Events P13.5.6 Enhancing Evacuation P13.5.7 Emergency Evacuation Capacity</p>

<p>8. Better Evacuation Planning Needed for Limited Mobility Populations</p>	<p>People needing emergency evacuations include non-driving populations: youth, poor, elderly, blind or disabled, non-car owning, suspended licenses. These are actually a significant part of the population and unique plans need to be devised to accommodate them in emergencies. Constrained roadways and parcel groups of concern are highlighted but don't call out these populations.</p> <p>Perhaps census areas where people don't own cars can be added. The City should partner with OCTA well in advance of any emergency to make sure that solutions for these populations are robust and Adequate. General Plan Fair Share Policy P514 should be enhanced so bus, bike and pedestrian facilities are Adequate.</p> <p>Transportation systems on p. 27 do not mention bus, rail bike and pedestrian and shared ride service (Lyft, Uber) transportation at all.</p> <p>P 15 of the Climate Vulnerability Assessment mentions transportation systems assuming most people will evacuate by arterial highways. It does mention OCTA buses but provides no plan or reference to a plan for OCTA's service during emergencies or bus strikes. It also neglects to mention the City's 2 major bus stations – the Fullerton Transportation Center (FTC) and the Fullerton Park n Ride. The city's 2 taxi stands at FTC and possibly still at the Marriot Hotel are not referenced. Neither is there a map showing bus routes by weekday, Saturdays, and Sundays + holidays which have different spans of service. shared ride service (Lyft, Uber) is not mentioned but are a lifeline for</p>	<p>Fullerton's emergency evacuation planning efforts predominantly focus on developing content for the Emergency Operations Plan (EOP) or associated annexes. The General Plan and LHMP are not operational documents that the City would rely on to support these types of efforts.</p> <p>Approximately 5% of Fullerton households do not have a personal vehicle, while the vast majority of California residents evacuate using their own transportation on City arterials. Coordination with OCTA and identification of solutions for vulnerable populations is best suited for the EOP and not the Safety Element.</p> <p>The discussion on page 27 of the Climate Adaptation Vulnerability Assessment focuses on transportation system sensitivity to extreme heat events. Page 15 of the document generally describes the transportation assets, which include roadways, buses, trains, and airplanes.</p> <p>The level of detail identified in the comment regarding OCTA and other transportation options is more detailed than typically found in a general plan and outside the scope of a Safety Element. While we have come to understand that OCTA buses would operate on their regular routes if an evacuation warning or order closes the area the buses are in, the ultimate decision on how to operate their system during normal times or emergency situations is outside of the City's control. During an emergency situation, OCTA will indicate the types of support they will undertake during an emergency, which may include taking evacuees to stops outside the evacuation zones or nearest to any Care & Reception Center or shelters, as the evacuees choose.</p>
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Recommendation Title	Comment	City Response
	<p>many without cars. Bike routes and sidewalk shortfalls are also not addressed.</p> <p>CW-7 should be enhanced to include non-driving populations: CW-7: Coordinate with regional and local transportation and transit agencies to ensure continued access and movement in the event of an emergency.</p> <ul style="list-style-type: none"> • Coordinate with Caltrans and Orange County Transit Authority to assess the vulnerability of transportation infrastructure and primary evacuation routes to hazardous climate-related events. 	<p>While individual jurisdictions can request emergency transportation support from OCTA, its availability depends on the time of day, OCTA's operational posture, and conditions elsewhere. For these reasons, jurisdictions may decide not to depend on OCTA to support a fast-moving evacuation.</p> <p>Passenger rail service is unlikely to be available during an evacuation. The operators of these lines would likely stop service within evacuation zones or areas at potential risk. In addition rail operations generally can't be planned and executed on short notice due to the complexities of freight logistics and the heavy traffic occurring on many of the rail lines throughout the southland.</p> <p>Rideshare operators typically don't allow their drivers to enter active fire evacuation zones. Their drivers aren't covered by workers compensation if they're injured or become ill while driving in unsafe areas.</p> <p>CW-7 is an adaptation strategy focused on community wide coordination regarding transit and transportation capabilities.</p> <p>Chapters 4 and 5 of the Fullerton Plan also address many of these topics. Future updates to these chapters could accommodate these concerns more effectively than the Safety Element.</p>

Recommendation Title	Comment	City Response
9. Weather Extremes	Cold weather shelters should be addressed. EH-2 should be enhanced to add trees and other cooling elements to vulnerable communities: EH-2: Develop facilities and resources to reduce the effects from extreme heat events.	<p>Cold weather events have not required the city to open a warming center on a regular basis. The city has the ability to operate facilities if necessary, but the need has been minimal.</p> <p>Comments on modifying EH-2 to add other cooling elements are not considered necessary at this time. This strategy reads as follows:</p> <ul style="list-style-type: none"> • EH-2: Develop facilities and resources to reduce the effects from extreme heat events • Expand number of publicly operated cooling centers based on the need of vulnerable populations. • Collaborate with local businesses and institutions to provide a “Cool Zone” area network (i.e., cooling centers). • Develop a tree and shade master plan with a particular focus on climate resilient tree species. <p>As written the strategy provides the city with flexibility in how they address trees and shading.</p>
10. Police and Fire Response Times	Taller buildings increase police and fire response time as well as add to cost. A full discussion of this should be done. My understanding from Appendix D during the HIOZ process was that the City’s fire response times are already below Adequate.	The Program EIR for the HIOZ approved by the Planning Commission on 9-25-24 regarding Public Services indicated: Implementation of the Program would have a less than significant impact on fire protection services (PEIR pp. 4.9-17 to 4.9-18).

Recommendation Title	Comment	City Response
11. Asbestos and Lead	I would like to see a policy regulating Police and Fire use of buildings with Asbestos-Containing Materials (ACM) and Lead-Containing Materials (LCM) that currently are used as practice areas with no guidelines for remediation. These often cause an unintentional violation of environmental mitigations. Also, a program should call out the asbestos siding on many historic-age houses and possibly provide assistance with safe removal.	The City defers all property owners to the South Coast Air Quality Management District (SCAQMD) when asbestos or lead is determined to be present in a structure. The information and forms are available on the SCAQMD at this link: https://www.aqmd.gov/home
12. Sewer and Industrial Wastewater Issues	Would like to see Sewer called out in the Lifeline Utilities section rather than embedded in the Water section. OC Sanitation's cooperation in this, as well as wastewater.	The Lifeline Section of the Climate Adaptation Vulnerability Assessment is a major category that includes various infrastructure components like electricity, oil and gas, and water supply. Sewer resources were identified in the water supply portion of the section, which is common. Reorganization of this content would not change the overall results of the analysis and would be an added expense to the city.
13. Oil Spills and Pipelines	Please address oil spills and pipeline disruptions more clearly, not just oil and gas pipelines but also industrial wastewater and sewer. P. 16 mentions no major pipelines through Fullerton, but I don't believe that's the case.	This is a valid concern for a community like Fullerton. The regulation and oversight of hazardous materials and wastes is the responsibility of Orange County Environmental Health. In addition, oil activities are also overseen by California Geologic Energy Management Division (CalGEM). While these issues are a concern for the City, addressing them in Chapter 19 – Open Space and Natural Resources may be better suited to the city's needs.
14. Water Quality Issues	Much of Fullerton in is a toxic plume area. This should be highlighted as there could be additional groundwater threats and drinking water contaminants.	While this is a key concern for the City and region, addressing this from a policy perspective it is better addressed in Chapter 16 – Water. Several goals and policies focus on water quality.

Recommendation Title	Comment	City Response
15. Sensitive Receptors	Please address the situation that the new Housing Incentive Overlay Zone will now have residential units with sensitive receptors much closer to industrial pollution. Please see my other comments on this issue. Please add a goal mandating Health Risk Assessments for sensitive receptors as appropriate. City environmental documents often skip this requirement.	While this is an important issue, addressing sensitive receptors is outside the scope of a Safety Element. This is often addressed in the land use element and/or environmental justice element. Chapter 11, Public Health would be an appropriate location for this type of policy.
16. Tree Risks	Address tree falling risk safety as a part of the Safety Element. Current “topping” practices and watering the base of trunks have increased this risk in the past decade.	Tree mortality was discussed in the Climate Adaptation Vulnerability Assessment. In addition, landscaping practices are not policy issues that the General Plan would address. Instead this would be better addressed in the municipal code, which is an enforcement document.
17. Natural Resources Impacts	p. 29 Natural Resource areas – Impact on Fullerton’s unusual array of native bees and pollinators should be added.	This section of the Climate Adaptation Vulnerability Assessment is referencing a study from Science regarding declining bee populations. If a local study has been conducted on localized bee populations this could be included if available. However, this addition does not change the outcome of the analysis.
18. Rail Inclusion	Hazardous material risk on. P 16 should include rail and rail lines should be added to all areas of the document discussing hazardous materials transportation.	A reference to rail transport of hazardous materials can be added to P. 16 of Appendix I.
19. Air Safety	Address the major increase that helicopter commuting services will have on public safety.	Issues associated with airport operations are typically addressed by the Airport Land Use Commission (ALUC). If this condition begins to affect city services, the City should work with the ALUC to address these concerns.

Recommendation Title	Comment	City Response
20. Fireworks	It would be helpful to mention the City's fireworks restrictions in this document.	Fireworks restrictions are already codified in the municipal code. Mentioning this is not a requirement to meet state requirements for general plans. If desired, this could be added at the City's discretion.

Attachment No. 4

Local Hazard Mitigation Plan

Local Hazard Mitigation Plan

City of Fullerton

Final City Council Draft
(Adopted)

May 21, 2020



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ABBREVIATIONS

AB: Assembly Bill

AR: Atmospheric River

CAL FIRE: California Department of Forestry and Fire Prevention

Cal OES: California Governor's Office of Emergency Services

CDH: California Department of Public Health

CEC: California Energy Commission

CFR: Code of Federal Regulations

CGS: California Geological Survey

ENSO: El Niño Southern Oscillation

EF: Enhanced Fujita (scale)

EPA: United States Environmental Protection Agency

FEMA: Federal Emergency Management Agency

FHSZ: Fire hazard severity zone

FRA: Federal Responsibility Area

IPCC: Intergovernmental Panel on Climate Change

LRA: Local Responsibility Area

MMI: Modified Mercalli Intensity (scale)

MMS: Moment Magnitude Scale

MWD: Metropolitan Water District of Southern California

MWDOC: Municipal Water District of Orange County

NOAA: National Oceanic and Atmospheric Administration

NWS: National Weather Service

OCFA: Orange County Fire Authority

OCFCD: Orange County Flood Control District

OCTA: Orange County Transportation Authority

OCWD: Orange County Water District

SB: Senate Bill

SCE: Southern California Edison

SCEDC: Southern California Earthquake Data Center

SoCalGas: Southern California Gas Company

SRA: State Responsibility Area

UCERF3: Third Uniform California Earthquake Rupture Forecast

USGS: United States Geological Survey

WRCC: Western Regional Climate Center

WUI: Wildland-urban interface

GLOSSARY

100-year flood: A flood that has a 1 percent chance (one in 100) of occurring in any given year.

500-year flood: A flood that has a 0.2 percent chance (one in 500) of occurring in any given year.

ARkStorm: An emergency planning scenario that modeled a repeat of California's 1861–1862 winter storms, which caused unprecedented flooding throughout the state.

Atmospheric river: A narrow band of very moist air in the atmosphere that can generate intense storms. Up to 50 percent of California's annual rainfall comes from the relatively small number of atmospheric storms.

Climate change: Long-term changes in the average meteorological conditions (temperature, precipitation, wind, etc.) of an area.

Critical Facility: Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and emergency management plans. For purposes of this plan, critical facilities include locations that serve an emergency support function within the City and should be able to remain operable not only through a hazard event but also after a hazard event has already occurred.

Derecho: A type of intense windstorm that blows in a straight line, caused by a strong, large thunderstorm.

Downburst: A type of intense windstorm that descends from a strong thundercloud and then gusts out in all directions.

El Niño Southern Oscillation: A natural cycle of wind and water temperatures in the eastern tropical areas of the Pacific Ocean that affects global weather patterns, including precipitation levels in California. Consists of a warm phase (El Niño), a neutral phase, and a cool phase (La Niña).

Epicenter: The point on the surface of the ground below which an earthquake begins.

Facility of Concern: A facility that is not critical in nature but is identified by the City because it plays a significant role in emergency response and recovery.

Fault line: A boundary between sections of the earth's surface.

Fault rupture: An event in which sections of the earth's surface suddenly move past each other along part or all the length of a fault. The sudden movement generates the shaking that we perceive as an earthquake.

Flash flood: A dangerous type of flood that occurs very quickly, with little warning. Usually a result of sudden, intense precipitation.

Flood plain: The area that may be affected by a flood, usually named by the type of flood that can occur there (e.g. a 100-year flood plain).

Katabatic wind: A hot dry wind, caused when areas of high pressure occur over an area of high elevation, and lower pressure zones form over lower elevations. As the wind descends, it heats up, becomes drier, and can increase in speed.

Liquefaction: A phenomenon in which loose, wet soil is suddenly shaken, causing the soil to behave more like a fluid and lose its stability. Often caused by earthquakes.

Microburst: A downburst that affects a small area, although the wind speeds are not necessarily less intense than a full-scale downburst.

Modified Mercalli Intensity scale: A way of measuring the intensity of an earthquake based on the damage it causes at a specific location. As a result, an earthquake will register a different rating on the Modified Mercalli Intensity scale in different places.

Moment Magnitude Scale: A way of measuring the intensity of an earthquake based on the amount of energy released by the fault rupture. A replacement for the Richter Scale.

Ponding: A type of flooding caused when water collects in a low-lying area.

Rupture: See “Fault rupture.”

Santa Ana winds: A type of katabatic wind that affects the coastal areas of southern California. They are commonly known for fanning wildfires.

Sea level rise: A global increase in the level of the ocean, driven by melting land ice and increases in water temperature as a result of climate change.

Snowpack: Snowfall that accumulates in cold mountain areas and remains frozen for a long period of time. In California, snowpack in the Sierra Nevada provides a large amount of water to the state during the summer and early autumn months as it melts.

State Water Project: An extensive system of aqueducts and pumps that conveys water from the northern Sierra Nevada to cities and agricultural lands throughout California, including the Los Angeles region.

Subduction zone: A location where two tectonic plates come together, one moving underneath the other. Strong earthquakes in these regions are responsible for most major tsunamis.

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CHAPTER 1

INTRODUCTION

PLAN PURPOSE AND AUTHORITY

Hazard events can lead to injuries or death, affect overall health and safety, damage or destroy public and private property, harm ecosystems, and disrupt key services. Although the hazard event itself often gets the most attention, it is only one part of a larger emergency management cycle.

Emergency planners and responders can take steps during the response, recovery, mitigation, and preparedness phases of the cycle to minimize the harm caused by a disaster. This Local Hazard Mitigation Plan (LHMP or Plan) focuses on optimizing the mitigation phase of the cycle. Mitigation involves making a community more resilient to disasters so that when hazard events do ultimately occur, the community suffers less damage and is able to recover more effectively. It differs from preparedness, which is planning in advance for how best to respond when a disaster occurs or is imminent. For example, a policy to make homes structurally stronger so they suffer less damage during an earthquake is a mitigation action, while fully equipping shelters to accommodate people who lose their homes in an earthquake is a preparedness action. Some activities may qualify as both.

Fullerton, like all other communities, could potentially suffer severe harm from hazard events, and although large disasters may cause widespread devastation, even smaller disasters can have substantial effects. Fullerton cannot make itself completely immune to hazard events, but this Plan can help make the community a safer place to live, work, and visit. This Plan provides a comprehensive assessment of the threats that Fullerton faces from natural and human-caused hazard events and a coordinated strategy to reduce these threats. It identifies resources and information that can help community members, City staff, and local officials understand local threats and make informed decisions. The LHMP can also support increased coordination and collaboration between the City, other public agencies, local employers, service providers, community members, and other key stakeholders.



KEY TERMS

Hazard event: An emergency as a result of a natural or human-caused event that has the potential to cause harm.

FEDERAL AUTHORITY

Fullerton is not required to prepare an LHMP, but state and federal regulations encourage it. The federal Robert T. Stafford Disaster Relief and Emergency Act, amended by the Disaster Management Act of 2000, creates a federal framework for local hazard mitigation planning. It states that jurisdictions that wish to be eligible for federal hazard mitigation grant funding must prepare a hazard mitigation plan that meets a certain set of guidelines and submit this plan to the Federal Emergency Management Agency (FEMA) for review and approval. These guidelines are outlined in the Code of Federal Regulations, Title 44, Part 201, and discussed in greater detail in FEMA’s Local Mitigation Plan Review Tool.

STATE AUTHORITY

California Government Code Sections 8685.9 and 65302.6

California Government Code Section 8685.9 (also known as Assembly Bill 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 the Disaster Management Act of 2000 and has incorporated the hazard mitigation plan into the jurisdiction’s general plan. In these cases, the State may cover more than 75 percent of the remaining disaster relief costs.

All cities and counties in California must prepare a general plan, which must include a safety element that addresses various hazard conditions and other public safety issues. The safety element may be a stand-alone chapter or incorporated into another section, as the community wishes. California Government Code Section 65302.6 indicates that a community may adopt an LHMP into its safety element as long as the LHMP meets applicable state requirements. This allows communities to use the LHMP to satisfy state requirements for safety elements. As the General Plan is an overarching long-term plan for community growth and development, incorporating the LHMP into it creates a stronger mechanism for implementing the LHMP.

California Government Code Section 65302 (g)(4)

California Government Code Section 65302 (g)(4), also known as Senate Bill (SB) 379, requires that the safety element of a community’s general plan address the hazards created or exacerbated by climate change. The safety element must identify how climate change is expected to affect hazard conditions in the community and include measures to adapt and be more resilient to these anticipated changes.

Because the LHMP can be incorporated into the safety element, including these items in the LHMP can satisfy the state requirement. SB 379 requires that climate change must be addressed in the safety element when the LHMP is updated after January 1, 2017, for communities that already have an LHMP, or by January 1, 2022, for communities without an LHMP.

KEY TERMS

Mitigation: Actions that increase resiliency and reduce the harmful effects of a hazard.

Resilient: Better able to avoid or lessen the harmful effects of a hazard.

This LHMP is consistent with current standards and regulations, as outlined by the California Office of Emergency Services (Cal OES) and FEMA. It uses the best available science, and its mitigation measures reflect best practices and community values. It meets the requirements of current state and federal guidelines and makes Fullerton eligible for all appropriate benefits under state and federal law and practices. Note that while FEMA is responsible for reviewing and certifying this LHMP, and Cal OES is responsible for conducting a preliminary review, this Plan does not grant FEMA or Cal OES any increased role in the governance of Fullerton or authorize either agency to take any specific action in the community.

PLAN ORGANIZATION AND USE

The Fullerton LHMP is both a reference document and an action plan. It has information and resources to educate readers and decision makers about hazard events and related issues, and a comprehensive strategy that the City and community members can follow to improve resiliency in Fullerton. It is divided into the following chapters:

- **Chapter 1: Introduction.** This chapter discusses the purpose and authority of the LHMP, its goals, how to use the Plan, and how it was developed.
- **Chapter 2: Community Profile.** This chapter provides an overview of the history of Fullerton, its demographics, the local economy, and its land uses and infrastructure.
- **Chapter 3: Hazard Assessment.** This chapter summarizes the various hazard conditions in Fullerton, their history, the risk of future occurrence, and any effects of climate change on their frequency and intensity. It also discusses how hazards were selected and prioritized for inclusion in this Plan.
- **Chapter 4: Threat Assessment.** This chapter discusses the threat to community members, buildings, and infrastructure posed by individual hazard types. It also summarizes the methods and approach used to prepare the threat assessment.
- **Chapter 5: Hazard Mitigation Strategy.** This chapter contains specific hazard mitigation actions to improve resiliency in Fullerton and a discussion of how the mitigation actions were developed.
- **Chapter 6: Plan Maintenance:** This chapter discusses how the Plan will be implemented and summarizes how Fullerton can monitor and update the Plan in future years.



Local Mitigation Planning Handbook

March 2013



FEMA's Local Mitigation Planning Handbook, last updated in 2013, is one of the key guidance documents for local communities in preparing hazard mitigation plans.

- **Chapter 7: References:** This document contains all the references and images used throughout the document.

PLAN GOALS

This Plan was developed to broadly increase resiliency in Fullerton. There are five key goals for Fullerton's LHMP:

- Reduce and isolate threats to public safety and property in Fullerton.
- Maintain government operations and provisions of essential services to residents and stakeholders during and after a hazard event.
- Protect the natural environment through responsible stewardship of air, water, and open spaces in Fullerton.
- Promote resiliency and climate action in Fullerton through resilient infrastructure, responsive governance, and vibrant civic participation.
- Partner with surrounding local, regional, state, and federal jurisdictions in hazard mitigation efforts.

PLANNING PROCESS

State and federal guidance for local hazard mitigation plans do not require that jurisdictions follow a standardized planning process. FEMA encourages communities to create their own planning process that reflects local values, goals, and characteristics. FEMA does suggest a general planning process:



The rest of this section describes the process used by the City to develop its LHMP.

HAZARD MITIGATION PLANNING COMMITTEE

The City established a Hazard Mitigation Planning Committee. The Committee is made up of representatives from key City departments as well as stakeholder members that include residents, representatives from local and regional agencies, and companies that are key to hazard mitigation activities. These stakeholders are identified by asterisks (*). The City also informed other emergency managers from surrounding cities.

These members make up the Committee:

- Heather Allen, Planning Consultant, Fullerton Community Development
- Matt Foulkes, Planning Manager, Fullerton Community Development
- Adam Loeser, Deputy Chief, Fullerton Fire Department
- Kathy Schaefer, Division Chief, Fullerton Fire Department
- Pamela Mackie, Risk Management Specialist, Fullerton Human Resources
- Olga Vellanoweth, Risk Management Specialist, Fullerton Human Resources
- Alice Loya, Manager, Fullerton Parks and Recreation
- Doug Pickard, Parks Project Specialist, Fullerton Parks and Recreation

- Rhonda Cleggett, Lieutenant, Fullerton Police Department
- Dan Diaz, Street Division Superintendent, Fullerton Public Works
- Kevin Kwak, Senior Civil Engineer, Fullerton Public Works
- Wayne Elms, Landscape Supervisor, Fullerton Public Works
- William Roseberry, Sewer Superintendent, Fullerton Public Works
- Yelena Voronel, Principal Civil Engineer, Fullerton Public Works
- Hye Jin Lee, Water Systems Manager / Assistant City Engineer, Fullerton Public Works
- Laurie Bruneau, Risk Manager, Fullerton School District*
- Pearl Boelter, Environmental Health and Safety Director, Cal State Fullerton*
- Julie Lugaro, Associate Transportation Planner, Caltrans*
- Larry Lara, Director of Facilities, Fullerton College*
- Arlen Beck, Planning Technician, City of Placentia*
- Carlos Jaramillo, Deputy Director of Community Development, City of La Habra*
- Ian Whyte, Emergency Management Program Manager, Metropolitan Water District*
- Rudy Davila, Engineer, Orange County Sanitation District*
- Carl Erickson, Director of Human Resources and Risk Management, Fullerton Joint Unified School District*
- Hector Campos, Security Manager, St. Jude Medical Center*
- Rebecca Marsile, Health Educator, Orange County Health Care Agency*

The Committee held four meetings throughout the plan development process to lay out the methods and approach for the Plan, draft and review content, make revisions, and engage members of the public.

- **Committee Meeting #1 (June 14, 2018):** The Committee members confirmed the project goals and the responsibilities of the Committee. They revised the community engagement and outreach strategy, confirmed and prioritized the hazards to be included in the Plan, and identified critical facilities for the threat assessment.
- **Committee Meeting #2 (July 12, 2018):** Members held a detailed discussion about the results of the hazards assessment and mapping that showed the areas facing an elevated risk. The Committee also reviewed the hazard prioritization results.

- **Committee Meeting #3 (August 9, 2018):** The Committee reviewed the results of the risk assessment to identify the populations and assets that may face greater harm in a hazard event. The Committee also discussed potential hazard mitigation actions to address vulnerabilities.
- **Committee Meeting #4 (September 13, 2018):** The Committee reviewed the draft mitigation measures, made revisions, and assigned priorities.

Invitation to Committee meetings were provided via email with an accompanying calendar invitation. **Appendix A** contains copies of meeting agendas and sign in sheets for the Hazard Mitigation Planning Committee meetings.

PUBLIC ENGAGEMENT

Under FEMA guidelines, local hazard mitigation planning processes should create opportunities for members of the public to be involved in plan development—at a minimum, during the initial drafting stage and during plan approval. The Committee chose to go beyond minimum standards and conduct more extensive community outreach to help ensure that the LHMP reflects community values, concerns, and priorities. The Committee developed a community engagement and outreach strategy to guide all public engagement activities. **Appendix B** contains a copy of the strategy.

Public Input Meeting

An in-person public meeting was a central component of the City’s engagement efforts. This meeting provided an opportunity for members of the public to learn about the LHMP in depth—the plan development process, the hazards of concern, and the mitigation strategy and individual actions. At this meeting, members of the public could speak directly to City staff and other stakeholders and provide detailed feedback. The City held one public meeting prior to public review. Notices of this meeting were widely distributed in advance, in accordance with City notification requirements, the engagement strategy, legal requirements, and best practices.

- **Public Input Meeting (October 10, 2018):** This meeting was held concurrently with the City of Fullerton Planning Commission meeting. Project staff from PlaceWorks and City staff gave a presentation to the members of the Commission and members of the public in attendance. Speakers discussed the process of the Plan development, the importance of having an LHMP, and took questions and comments from the Commission members. No additional public comments were submitted during the meeting.

Online Engagement

The City recognized that not all community members are able to attend public meetings and conducted public engagement through social media and online platforms. City staff set up a project website as a simple, one-stop location for community members to learn about the LHMP. The website included information about what an LHMP is and why the City prepared one. It had links to materials and plan documents as they became available and allowed members of the public to receive notifications about upcoming events. City staff also used social media accounts, such as Facebook, Twitter, and NextDoor, to send quick notifications or bursts of information about the Plan and the development process.

A central part of the online engagement was an online survey. This survey asked community members about their experience and familiarity with emergency conditions, their level of preparedness for future emergencies, and preferred actions for the City to take to increase resiliency in Fullerton. The survey had responses from 137 community members; those responses are summarized here:

- Most survey respondents (81 percent) indicate that they have not been impacted by a hazard event.
- The top three hazards that have impacted the most residents are: (1) Seismic hazards (52 percent of respondents), (2) Disease/pests (30 percent of respondents), and (3) Severe weather (30 percent of respondents).
- Most respondents express concern (36 percent very concerned and 35 percent somewhat concerned) that climate change could introduce new hazards or make existing hazards in Fullerton worse. 1 in 4 respondents are not at all concerned (25 percent).
- Nearly half of all homeowner respondents report having adequate homeowners' insurance to cover the hazards that could potentially impact their home (48 percent). Only a miniscule amount of homeowners report having no insurance policy (1 percent).
- While most respondents indicate not having flood insurance for their home, they indicate they are interested (70 percent). About 1 in 4 respondents already have flood insurance (26 percent).
- Among the disaster preparedness household items, the top three items residents indicate they already possess are: (1) can opener (93 percent), (2) cooking and eating utensils (88 percent), (3) battery-powered flashlight (86 percent).
- Most respondents are uninvolved and uninterested in their local Community Emergency Response Team (CERT) (65 percent). Roughly 1 in 4 respondents are uninvolved but want more information about CERT.
- The overwhelming majority of respondents convey that the most effective strategy to help them become better prepared for a disaster includes effective emergency notification and communication (86 percent).
- Most respondents (71 percent) work for an employer who has a disaster recovery plan.

Appendix B contains copies of materials used for public outreach, including the full results of the community survey.

PUBLIC REVIEW DRAFT

On March 14, 2019, Fullerton released a draft copy of the LHMP for public review and comment. The document was posted electronically on the City's website, and hard copies were made available at the Fullerton Public Library, City Clerk's Office, and the Community Development Department. The City distributed notifications about the public review draft through social media accounts and other online sources. Members of the Hazard Mitigation Planning Committee were notified via email and provided a

link to the project webpage. Additionally, community members who completed the online survey and provided an email address to receive additional information will be notified of the release of the draft.

PLAN REVISION AND ADOPTION

One public comment was received during the public review period. The comments received focused on technical accuracy and organization of the document. In response to these comments, some of the sections of the document were re-organized to flow better and better describe the issues within the plan. Upon completion of these revisions, the Plan was submitted to Cal OES and FEMA. Upon receipt of approval from state and federal agencies, the final draft was submitted to City decision makers. Upon adoption of the Plan, the Fullerton City Council conducted a hearing, whereby the public was invited to submit final comments or concerns regarding the document.

The Fullerton City Council adopted the final LHMP on May 19, 2020. **Appendix C** contains a copy of the adoption resolution.

PLAN RESOURCES

The Committee used a number of different plans, studies, technical reports, datasets, and other resources to prepare the hazard assessment, mapping, threat assessment, and other components of this Plan. **Table 1-1** provides some of the primary resources the Committee used to prepare this Plan.

TABLE 1-1: KEY RESOURCES FOR PLAN DEVELOPMENT

Section	Key Resources	Example Uses
Multiple sections	<ul style="list-style-type: none"> • Cal-Adapt • California Department of Conservation • California Geological Survey • California Office of Emergency Services • California State Hazard Mitigation Plan • City of Fullerton General Plan (The Fullerton Plan) • City of Fullerton 2010 Local Hazard Mitigation Plan • FEMA Local Hazard Mitigation Plan Guidance • National Oceanic and Atmospheric Administration • National Weather Service • US Geological Survey • US Census Bureau 2011-2015 American Community Survey 	<ul style="list-style-type: none"> • Science and background information on different hazard conditions. • Records of past disaster events in and around Fullerton. • Current and anticipated climate conditions in and around Fullerton. • Projections of future seismic conditions and events. • Prior mitigation actions and strategies to verify the progress achieved
Community Profile	<ul style="list-style-type: none"> • City of Fullerton financial and economic reports • California Energy Commission • Fullerton Public Library 	<ul style="list-style-type: none"> • Demographic information for Fullerton and Orange County. • History of the region. • Economic trends in Fullerton. • Commute patterns in Fullerton. • Local land uses patterns. • Background information on utilities serving Fullerton.
Hazard Assessment (Dam Failure)	<ul style="list-style-type: none"> • LIDAR survey • Orange County Water District 	<ul style="list-style-type: none"> • Mapping of dam failure inundation areas.

TABLE 1-1: KEY RESOURCES FOR PLAN DEVELOPMENT

Section	Key Resources	Example Uses
	<ul style="list-style-type: none"> • US Army Corps of Engineers 	<ul style="list-style-type: none"> • Profiles and conditions of dams in and around Fullerton.
Hazard Assessment (Disease and Pest Hazards)	<ul style="list-style-type: none"> • California Department of Public Health • Centers for Disease Control • World Health Organization 	<ul style="list-style-type: none"> • Science and historical records of disease outbreaks.
Hazard Assessment (Fire Hazards)	<ul style="list-style-type: none"> • California Department of Forestry and Fire Prevention • Fire and Resource Assessment Program 	<ul style="list-style-type: none"> • Records of past fire events. • Location of fire hazard zones in and around Fullerton.
Hazard Assessment (Flood Hazards)	<ul style="list-style-type: none"> • FEMA Map Service Center • Orange County Flood Control District 	<ul style="list-style-type: none"> • Records of past flood events in and around Fullerton. • Locations of flood-prone areas in Fullerton.
Hazard Assessment (Human-Caused Hazards)	<ul style="list-style-type: none"> • City of Fullerton Airport Master Plan • Global Terrorism Database 	<ul style="list-style-type: none"> • Historical records of terrorism. • Flight paths over Fullerton.
Hazard Assessment (Hazardous Materials Release Hazards)	<ul style="list-style-type: none"> • Agency for Toxic Substances and Disease Registry 	<ul style="list-style-type: none"> • Location and dates of past hazardous materials release. • Effects of hazardous materials release.
Hazard Assessment (Seismic Hazards)	<ul style="list-style-type: none"> • Southern California Earthquake Data Center • The Third California Earthquake Rupture Forecast (UCERF3) 	<ul style="list-style-type: none"> • Locations of fault zones. • Records of past earthquakes.
Hazard Assessment (Severe Weather Hazards)	<ul style="list-style-type: none"> • California Department of Water Resources • US Drought Monitor • Western Regional Climate Center 	<ul style="list-style-type: none"> • Science and background information of severe weather events. • Historical record of severe weather events in and around Fullerton.

Note: Sections that are not individually called out in this table relied primarily on sources identified in multiple sections.

CHAPTER 2

COMMUNITY PROFILE

This chapter of the LHMP is a summary of Fullerton’s physical setting, history, economy and demographics, current and future land uses, and key infrastructure. The community profile establishes the baseline conditions that inform the development of the hazard mitigation actions in **Chapter 5**.

SETTING AND LOCATION

Fullerton is 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.

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 (Juañeno) 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 (Orange County Archives n.d.a, n.d.b).

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 (Fullerton 2010).

After the Second World War, there was high demand by veterans and their families for new housing in southern California. Fullerton was one of many communities in the area that experienced a construction boom of new housing developments (Fullerton 2010). It was also during this time, in 1957, that the State of California established Orange County State College (today California State University, Fullerton) (CSUF 2009). In the same year, St. Jude Hospital (now St. Jude Medical Center) was opened (St. Jude 2018). This period of intense building and development lasted nearly thirty years, from the late 1940s to the 1970s. In the 1980s and 1990s, the City revitalized its downtown area and upgraded existing and constructed new public facilities, including libraries, parks, natural areas, and general city services. Today, Fullerton is a community with vibrant education and healthcare sectors, a bustling manufacturing area, thousands of homes, and a renewed downtown center (Fullerton 2010).



Intersection of Commonwealth and Harbor in 1886. Image from the Fullerton Public Library



Cal State Fullerton under construction in 1963. Image from the Fullerton Public Library

DEMOGRAPHICS

The US Census Bureau’s American Community Survey estimates Fullerton’s population at 138,976 residents as of 2015. It is the seventh largest of Orange County’s 34 cities by population (US Census Bureau 2015a).

Compared to Orange County as a whole, Fullerton residents are younger, with a lower median household income and a lower level of home ownership. **Table 2-1** shows the basic demographics for Fullerton and Orange County.

TABLE 2-1: BASIC DEMOGRAPHICS, FULLERTON AND ORANGE COUNTY (2015)

	Fullerton	Orange County
Total population	138, 976	3,116,096
Percent of residents that are children (less than 10 years)	12.4%	12.4%
Percent of residents that are senior citizens (65+ years)	12.5%	12.8%
Median age	34.5	37.1
Total households	47,319	1,009,353
Median household income	\$65,974	\$76,509
Percent of rental households	48.3%	42.3%

Source: US Community Census 2015a, 2015b, 2015c.

A smaller proportion of Fullerton residents identify as white compared to Orange County residents. Approximately 40 percent of Fullerton residents identify as nonwhite, compared to approximately 37 percent of Orange County residents. **Table 2-2** shows the racial and ethnic composition in Fullerton and Orange County.

TABLE 2-2: RACIAL AND ETHNIC COMPOSITION, FULLERTON AND ORANGE COUNTY (2015)

Race or Ethnicity	Fullerton		Orange County	
	Population	Percentage	Population	Percentage
White	77,137	59.3%	1,970,000	63.2%
Black or African-American	3,357	3.3%	51,816	1.6%
American Indian and Alaska Native	362	1.2%	12,476	0.4%
Asian	34,490	26.8%	590,342	18.9%
Native Hawaiian and Other Pacific Islander	368	0.7%	9,529	0.3%
Other race	17,252	13.4%	368,220	11.8%
Two or more races	6010	2.7%	113,686	3.6%
Hispanic or Latino (of any race) *	48,974	35.2%	1,064,499	34.1%
Total	138,976	100%	3,116,096	100%

Source: US Census Bureau 2015d, 2015e.

* The US Census Bureau does not currently count persons who identify as Hispanic or Latino as a separate racial or ethnic category. Persons who identify as Hispanic or Latino are also included in the other racial or ethnic categories.

Fullerton residents' level of educational attainment is on a par with the average Orange County resident. Approximately 46 percent of adults 25 years of age or older in both Fullerton and Orange County have obtained a college degree. Approximately 13.4 percent of Fullerton adults have not finished high school, compared to 15.7 percent of Orange County adults. **Table 2-3** shows educational attainment for adults in Fullerton and Orange County.

TABLE 2-3: EDUCATIONAL ATTAINMENT OF RESIDENTS 25+ YEARS OF AGE, FULLERTON AND ORANGE COUNTY (2015)

Educational Attainment	Fullerton		Orange County	
	Population	Percentage	Population	Percentage
Less than 9th grade	6,558	7.3%	182,478	8.7%
9th grade to 12th grade (no diploma)	5,510	6.1%	144,383	6.9%
High school graduate or equivalent	16,702	18.6%	367,556	17.6%
Some college (no degree)	19,416	21.6%	436,584	21.0%
Associate's degree	6,962	7.7%	162,649	7.8%
Bachelor's degree	21,875	24.3%	506,749	24.3%
Graduate or professional degree	12,873	14.3%	277,384	13.3%
Total	89,896	100%	2,077,783	100%

Source: US Census Bureau 2015f.

Spanish is the most commonly spoken language in Fullerton after English, followed by Korean, Chinese, and Tagalog. Among residents at least five years of age, approximately 52 percent of Fullerton residents speak English at home, compared to approximately 69 percent of Orange County residents. Among speakers of the more common languages in Fullerton other than English, over half of Spanish and Tagalog speakers are fluent in English, but English fluency rates are lower among speakers of Korean and Chinese.

Table 2-4 shows the language proficiency among residents five years of age and older in Fullerton and Orange County.

TABLE 2-4: LANGUAGE PROFICIENCY OF RESIDENTS 5+ YEARS OF AGE, FULLERTON AND ORANGE COUNTY (2015)

Language Spoken at Home	Fullerton		Orange County	
	Number of Speakers	Percent Not Proficient in English	Number of Speakers	Percent Not Proficient in English
English	67,986	-	1,587,426	-
Spanish	32,704	41.4%	770,012	44.5%
Korean	13,510	58.7%	76,934	58.1%
Chinese	4,692	57.8%	71,112	48.9%
Tagalog	2,219	23.2%	48,176	26.7%
All other languages	9,128	40.0%	371,309	44%
Total	130,239	-	2,294,969	-

Source: US Census Bureau 2015g.

ECONOMY AND COMMUTE PATTERNS

Fullerton's economy features a robust education sector. According to the US Census, nearly 8,500 jobs are in educational services (approximately 16 percent of all jobs in Fullerton). Other major economic sectors are manufacturing (approximately 15 percent), healthcare and social assistance (approximately 14 percent), and retail trade establishments (approximately 12 percent) (US Census 2017). Most of Fullerton's largest employers are in education, healthcare, and aerospace. **Table 2-5** shows the major employers in the community.

TABLE 2-5: TEN LARGEST EMPLOYERS IN FULLERTON (2017)

Employer	Industry	Number of Employees	Percent of Total Employees
California State University, Fullerton	education	3,450	4.8%
St. Jude Medical Center	healthcare	1,963	2.7%
Raytheon Systems Co.	aerospace	1,320	1.8%
Albertsons Regional Office	retail	950	1.3%
Alcoa Fastening Systems	metals	750	1.0%
City of Fullerton	government	713	1.0%
St. Jude Heritage Health	healthcare	604	0.8%
Kimberly-Clark	personal care	440	0.6%
Vista Paint Corporation	construction	440	0.6%
Morningside of Fullerton	healthcare	403	0.5%
Total (Top 10 employers)	-	11,033	15.5%
All other employers	-	59,967	84.4%
Total jobs	-	71,000	100%

Source: Fullerton Comprehensive Annual Financial Report 2017.

Fullerton residents are mostly commuters—approximately 90 percent of employed residents travel outside of the community for work. They mostly travel to Anaheim, Santa Ana, Irvine, Costa Mesa, and other Orange County communities. Similarly, approximately 90 percent of people who work in Fullerton

come from other communities, predominantly from Anaheim, Los Angeles, and Santa Ana as well as other communities in Orange County (US Census 2017).

With major employers in the education, healthcare, and aerospace fields as well as the significant employment base throughout the City, Fullerton experiences a large increase in daytime population due to employee and student commutes. In 2018, CSU Fullerton had an enrollment of over 39,000 students, of which approximately 99% live off campus. In addition, Fullerton Community College is located several miles west of CSU Fullerton and has a total enrollment of approximately 24,000 students of which roughly one-third are considered full time with the remaining considered part time students.

LAND USES

The Fullerton Plan identifies the land uses allowed in the City (**Figure 1**). A majority of city land is designated for residential use. Other major uses designated throughout the City include Greenbelt Concept and Parks and Recreation, which contain large areas of active and passive open space, as well as industrial areas within the southern portions of the City. Other uses of significance include School, Government, and Religious Institution. (Fullerton 2016).

DEVELOPMENT TRENDS

Current development activities in the city typically involve residential or mixed-use infill development, usually on low-density commercial centers or parking lots, or rehabilitation of existing structures. In 2018, there were 33 development projects in progress under the supervision of the Community Development Department. These development projects include adaptive reuse of existing structures, commercial redevelopments, residential subdivisions, and mixed-use developments. Development of this plan has taken this new development into account and is informing land use planning decisions as these projects continue through the entitlement process. As a result, no further risks to Fullerton from these developments has resulted since the preparation of the previous LHMP. **Table 2-6** shows the number of developments in Fullerton by type:

TABLE 2-6: DEVELOPMENT CATEGORIES

Development Type	Number
Active Transportation	1
Adaptive Reuse	2
Apartment/Multifamily	7
Commercial	12
Industrial/Institutional	5
Mixed-Use	3
Single-Family Residential	2

Source: Fullerton 2018.

Notes of August 20, 2018.

INFRASTRUCTURE ASSESSMENT

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 (CEC 2016).¹ 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 (CEC 2015a).



Electrical substations are vital facilities to ensure that electrical service is safe and reliable. Image from Paul Chernikhowsky.

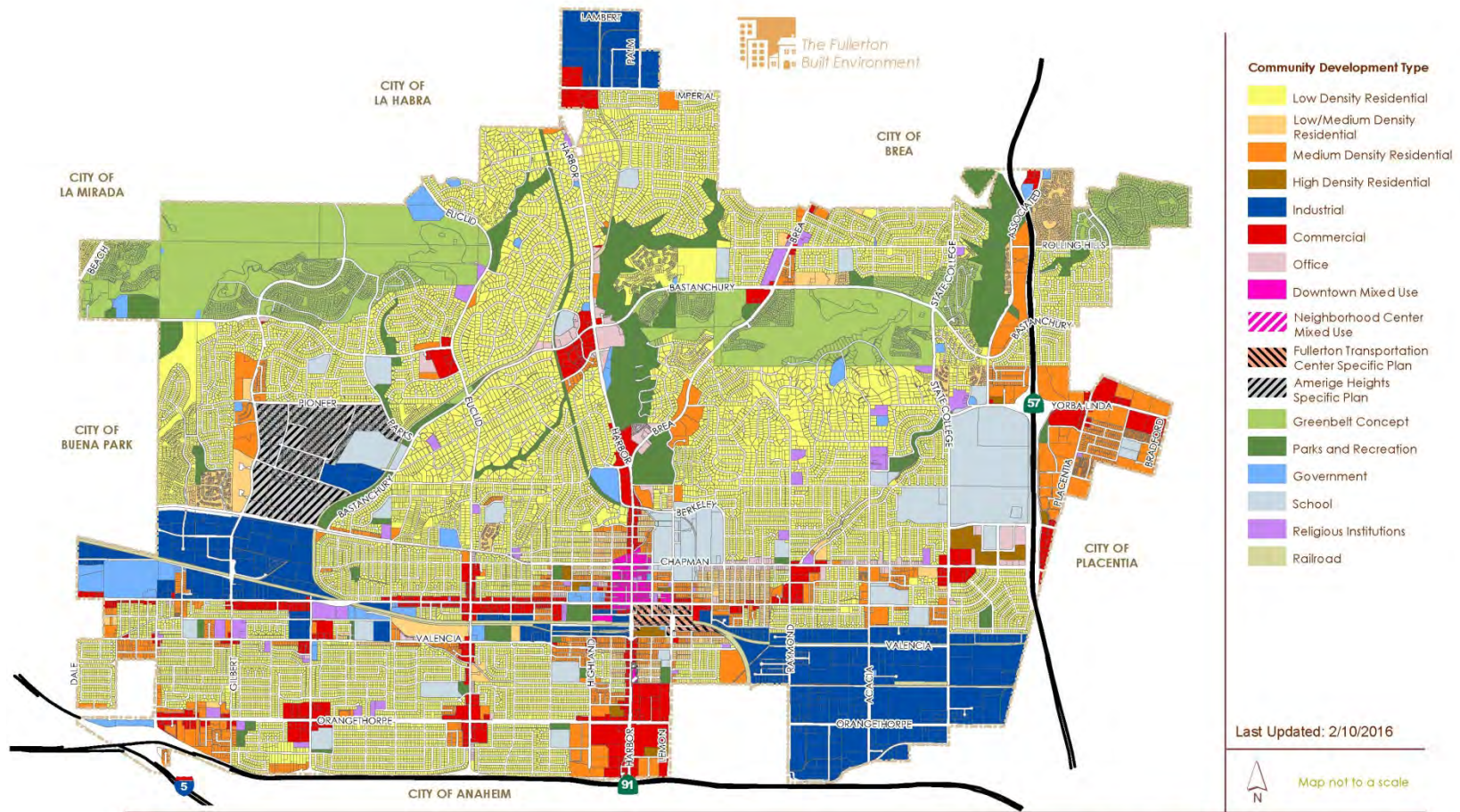
The one registered commercial power plant in the city is the CSUF Trigenation natural gas plant on the CSUF campus. There are also a number of noncommercial plants in Fullerton, including the CSUF State College solar photovoltaic plant, a natural gas plant on the Kimberly-Clark campus in southeastern Fullerton, and a number of small-scale solar panel installations. Fullerton has seven power substations: the Norweld, Gilbert, Sunnyhills, Basta, Fullerton, Paper, and Titans Substations. All of these substations are operated by Southern California Edison. There are also a number of nearby substations outside the city that are operated by Southern California Edison or by other providers. The major transmission lines in Fullerton run along Walnut Avenue, Orangethorpe Avenue, and Imperial Highway (State Route 90) and connect Fullerton to substations outside of the city. While these are not all of the transmission lines running through the City, these external connections provide Fullerton with some redundancies against power outages in the event that individual power lines are damaged, although damage to a substation or more widespread damage to power lines could result in a greater loss of power (CEC 2015b, 2017a).

NATURAL GAS AND OIL

Natural gas service 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 (SoCalGas 2018; CEC 2017b). Various facilities in neighboring Placentia, Anaheim, Brea, and other surrounding communities help to keep the natural gas flowing safely and reliably (CEC 2017b). Oil pipelines run through the neighboring cities of Buena Park and Brea; however no major transmission lines run through the City. 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. Similarly, an oil pipeline breach in neighboring cities could also lead to a fire that could impact Fullerton.

¹ As of 2015, as measured by the amount of electricity supplied.

Figure 2-1: General Plan Land Use Map

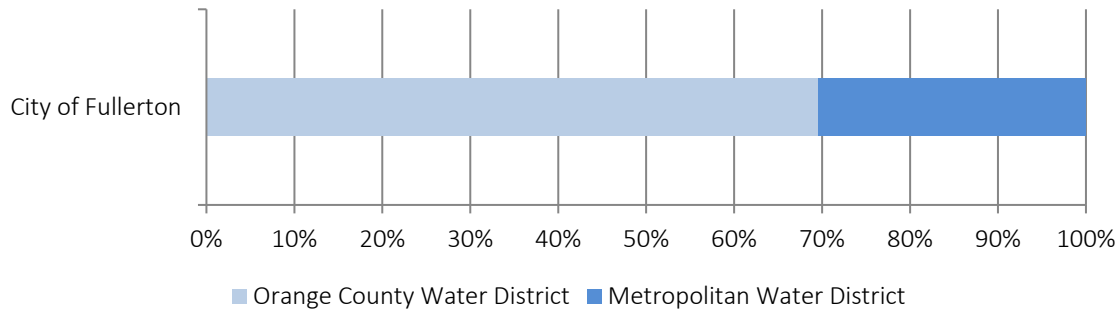


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WATER AND WASTEWATER

Most of Fullerton’s water is groundwater supplied by the Orange County Water District; the remaining water is imported from the State Water Project and Colorado River and is supplied to Fullerton through regional agencies. **Figure 2** shows the proportions of water sources for the City (Fullerton 2015).

Figure 2-2: Water Sources in Fullerton



Sources: Fullerton 2012, 2015.

Because some of the water used in Fullerton does not come from sources within the community, there is a risk that damage to local pipelines and pumping stations may interrupt the residents’ water supply. Imported water or groundwater pumped from elsewhere in Orange County may be affected by damage to water treatment plants and delivery infrastructure in the county. Water infrastructure damage in the Los Angeles Basin or the major aqueducts that supply the region may affect imported supplies.

According to Fullerton’s 2015 Urban Water Management Plan, the City maintains 15 storage reservoirs with a capacity of 69.5 million gallons. With a daily water demand of 223 gallons per capita per day (GPCD) and using the City’s 2015 population of 138,976 people, the City has enough reserves to supply everyone’s needs for roughly two days (Fullerton 2015).² This assumes no restrictions are enacted or that GPCD does not decrease. The City maintains connection to a regional pipeline network that allows it to receive water from other Orange County water suppliers in the event of short-term emergencies.

Wastewater service in the community is supplied by the Orange County Sanitation District (OCSD). The City operates miles of sewer lines and pump stations that collect wastewater from buildings and facilities in Fullerton and conveys it to regional wastewater treatment facilities. The nearest wastewater treatment facility is the OCSD Plant in Fountain Valley. Damage to the City-owned

² This is determined by dividing the amount of reserve water by the GPCD multiplied by the City’s 2015 population. It can be expressed as the following equation: Reserve Capacity / (GPCD x 2015 population) = reserve duration period.

sewer system or to OCSF facilities may reduce treatment capacity or cause a leak, which in turn may pose a hazard to human and environmental health (Fullerton 2012a, 2015).

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



The pedestrian bridge over the tracks at the Fullerton Station. Image from PlaceWorks.

(State Route 91) runs along the southern border of Fullerton, and the Santa Ana Freeway (Interstate 5) runs nearby the southwest city limits. In the event of an emergency, most community members would likely evacuate in either direction along any of these arterial highways. If any of these routes become inaccessible, the other roadways and local streets could easily become congested. Use of the roadway system as evacuation routes will be based on the incident occurring and areas of the city impacted.

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. The Fullerton Municipal Airport serves general aviation aircraft.

CHAPTER 3

HAZARD ASSESSMENT

This chapter discusses the types of hazards that might reasonably happen in Fullerton. It describes these hazards and how they are measured, where in Fullerton they may occur, a history of these hazards in and around Fullerton, and the future risk they pose. The discussion of future risks includes any changes to the frequency, intensity, and/or location of these hazards as a result of climate change. This chapter also discusses how the Hazard Mitigation Planning Committee selected and prioritized the hazards in this Plan.

KEY TERM

Risk: The chance of a hazard happening—especially one of a particular size or intensity.

HAZARD IDENTIFICATION

Federal Emergency Management Agency (FEMA) guidance identifies a number of hazards that communities should evaluate for inclusion in a hazard mitigation plan. Communities may also consider additional hazards for their plans. The Committee reviewed an extensive list of hazard events and excluded the ones that do not pose a threat to Fullerton. **Table 3-1** lists the hazards considered by the Committee and indicates which ones have been included in the plan. The table also shows if a hazard is recommended for consideration by FEMA and if it is included in the 2013 “California Multi-Hazard Mitigation Plan.”

TABLE 3-1: HAZARD EVALUATION FOR FULLERTON LHMP

Hazard	Recommended for Consideration	Included in LHMP?	Reason for Inclusion or Exclusion
Agricultural pests	California plan	No	No major agricultural activity or resources in Fullerton.
Air pollution	California plan	No	Air pollution is a state and regional issue that is addressed through plans and regulations administered by the South Coast Air Quality Management District and/or California Air Resources Board.
Aircraft incident	California plan	Yes	Aircraft incidents are a potential risk to Fullerton.
Avalanche	FEMA guidance California plan	No	Avalanches do not happen in Fullerton.
Civil Disturbance or Riot	California plan	Yes	The Committee determined that civil disturbances should be included in the LHMP.
Climate change	California plan Orange County HMP	Yes (as a function of other hazard discussions)	Climate change contributes to the frequency, intensity, and/or location of other hazards. It is not a stand-alone hazard. It will be discussed as a factor for future hazards rather than as an event.
Coastal flooding and storms	FEMA guidance California plan	No	Fullerton is not a coastal city and is not affected by coastal flooding and storms.
Cyber Threats	California plan	Yes	The Committee determined that cyber threats should be included in the LHMP.
Dam failure	FEMA guidance California plan Orange County HMP	Yes	Fullerton is within the dam inundation areas for multiple dams in the region.

TABLE 3-1: HAZARD EVALUATION FOR FULLERTON LHMP

Hazard	Recommended for Consideration	Included in LHMP?	Reason for Inclusion or Exclusion
Drought	FEMA guidance California plan Orange County HMP	Yes	Droughts are a recurring and potentially severe hazard in Fullerton.
Earthquake	FEMA guidance California plan	Yes	Fullerton is in a seismically active area and has been impacted by earthquakes.
Energy shortage	California plan	No	Fullerton is not responsible for supplying energy to the community.
Epidemic in Vector-Borne Disease	California plan Orange County HMP	Yes	The Committee determined that epidemics and vector-borne diseases should be included in the LHMP.
Erosion	FEMA guidance California plan	Yes	Erosion has occurred in certain areas of Fullerton and occasionally threatens property and human health.
Expansive soil	FEMA guidance	No	There are no expansive soil issues identified in Fullerton.
Extreme cold	FEMA guidance California plan	No	Temperatures in Fullerton rarely become cold enough to pose a threat to health or safety.
Extreme heat	FEMA guidance California plan	Yes	The Committee determined that extreme heat is a hazard of concern to Fullerton.
Flood	FEMA guidance California plan Orange County HMP	Yes	Flooding has occurred in certain areas of Fullerton and occasionally threatens property and human health.
Fracking	California plan	No	While petroleum production occurs in and around Fullerton, fracking is not widely used enough within the city to pose a hazard to be included.
Hail	FEMA guidance	No	Hail that is severe enough to pose a threat to people and property is too rare in Fullerton to be included.
Hazardous materials release	California plan	Yes	The Committee determined that hazardous material releases are a hazard of concern.
Hurricane	FEMA guidance	No	Fullerton has never been significantly affected by a hurricane.
Infrastructure failure	California plan	No	The Committee determined that any sizeable risks posed by infrastructure failures are adequately addressed by other hazards in this LHMP.
Landslide	FEMA guidance California plan Orange County HMP	Yes	Landslides can occasionally occur in Fullerton.
Levee failure	FEMA guidance California plan	No	The committee determined that hazards related to levee failure are not an issue of concern for the City.
Lightning	FEMA guidance	No	Although lightning occurs occasionally in Fullerton, it is not sufficiently threatening to be separately included in this Plan. Any risks are addressed by other hazards in this LHMP.
Metal theft	California plan	No	This issue was not identified by the Committee as a concern in Fullerton.
Methane-containing soils	FEMA guidance Regional hazard plans	No	There are no methane-containing soil issues identified in Fullerton
Nuclear hazard	California plan	No	Nuclear hazards were not identified as a hazard of concern in Fullerton.
Sea level rise	FEMA guidance California plan	No	Fullerton is not a coastal city and therefore cannot be inundated by sea level rise in the foreseeable future.
Severe wind	FEMA guidance	Yes	Severe winds occasionally blow in Fullerton and pose a threat to people and property.

TABLE 3-1: HAZARD EVALUATION FOR FULLERTON LHMP

Hazard	Recommended for Consideration	Included in LHMP?	Reason for Inclusion or Exclusion
Severe weather and storms	FEMA guidance	Yes	Fullerton is at risk from severe weather and storms that threaten public safety and property.
Storm surge	FEMA guidance	No	Fullerton is not a coastal community and cannot be plausibly affected by storm surge.
Subsidence	FEMA guidance	Yes	Fullerton could be at risk of being affected by some subsidence that could endanger property.
Terrorism	California plan	Yes	The Committee determined that terrorism should be included in the LHMP.
Thunderstorm	FEMA guidance California plan	Yes	Thunderstorms could pose a danger to Fullerton's residents and property. This hazard is discussed as part of the severe weather hazard.
Tornado or Water Spout	FEMA guidance	Yes	This hazard is discussed as part of the severe weather hazard.
Transportation crashes	California plan	Yes	Fullerton is frequently impacted by transportation incidents.
Tree Mortality	California plan Orange County HMP	Yes	This hazard is discussed as part of the drought and severe weather hazards.
Tsunami	FEMA guidance California plan Orange County HMP	No	Fullerton is not a coastal city and therefore cannot be impacted by tsunamis.
Urban Fires	California Plan Orange County HMP	Yes	Fullerton has a history of urban fires that can endanger public safety and health. This is jointly discussed with wildfires under Fire Hazards.
Volcano	FEMA guidance California plan	No	There are no volcanoes near enough to Fullerton to reasonably pose a threat.
Wildfires	California plan Orange County Plan	Yes	Wildfires in Fullerton are likely due to a large amount of open and natural spaces in the city, such as the Coyote Hills. This is jointly discussed with urban fires under Fire Hazards.

The Hazard Mitigation Planning Committee combined multiple selected hazards into a single category, renamed some hazard types, and discussed some hazards with multiple subcategories in order to streamline the list and make it more accurately reflect the conditions in Fullerton.

- Fire Hazards: combines urban and wildland fires.
- Geologic Hazards: includes landslides/mudflows and subsidence
- Human-Caused Hazards: features aircraft incidents, civil disturbance or riot, transportation crashes, terrorism, and cyber threats.
- Seismic Hazards: addresses fault ruptures, seismic shaking, and liquefaction.
- Severe Weather: includes severe wind, extreme heat, heavy rain, lightning and tornadoes.

After hazard evaluation and the organizational changes made by the Committee, this Plan discusses 10 hazard types:

- Dam Failure
- Disease/Pests
- Drought
- Fire
- Flood
- Geologic Hazards
- Hazardous Materials Release
- Human-Caused Hazards
- Seismic Hazards
- Severe Weather

HAZARD SCORING AND PRIORITIZATION

The Committee followed FEMA guidance for hazard mitigation plans and prioritized each of the 10 hazards. In the initial step, the Committee assigned a score of 1 to 4 in four criteria for each of the 10 hazards. The four criteria are:

- **Probability:** The likelihood that the hazard will occur in Fullerton in the future.
- **Location:** The size of the area that the hazard would affect.
- **Maximum probable extent:** The severity of the direct damage of the hazard to Fullerton.
- **Secondary impacts:** The severity of indirect damage of the hazard to Fullerton.

The Committee assigned a weighting value to each criterion, giving a higher weight to the criteria deemed more important, and multiplied the score for each criterion by the weighting factor to determine the overall score for each criterion. The weighting values were recommended by FEMA:

- Probability: 2.0
- Location: 0.8
- Maximum probable extent: 0.7
- Secondary impacts: 0.5

Table 3-2 shows the rubric used to assign a score for each criterion.

TABLE 3-2: CRITERION SCORING

Probability		Maximum Probable Extent (Primary Impact)	
<i>The estimated likelihood of occurrence based on historical data.</i>		<i>The anticipated damage to a typical structure in the community.</i>	
Probability	Score	Impact	Score
Unlikely—less than a 1 percent chance in a given year.	1	Weak—little to no damage	1
Occasional—a 1 to 10 percent chance in a given year.	2	Moderate—some damage, loss of service for days	2
Likely—a 10 to 90 percent chance in a given year.	3	Severe—devastating damage, loss of service for months	3
Highly likely—more than a 90 percent chance in a given year.	4	Extreme—catastrophic damage, uninhabitable conditions	4
Location		Secondary Impact	
<i>The projected area of the community affected by the hazard.</i>		<i>The estimated secondary impacts to the community at large.</i>	
Affected Area	Score	Impact	Score
Negligible—affects less than 10 percent of the planning area.	1	Negligible—no loss of function, downtime, and/or evacuations	1
Limited—affects 10 to 25 percent of the planning area.	2	Limited—minimal loss of functions, downtime, and/or evacuations	2
Significant—affects 25 to 75 percent of the planning area.	3	Moderate—some loss of functions, downtime, and/or evacuations	3
Extensive—affects more than 75 percent of the planning area.	4	High—major loss of functions, downtime, and/or evacuations	4

After calculating the overall score for each criterion for each hazard, the scores for location, maximum probable extent, and secondary impact were summed to determine the total impact score for each hazard. FEMA guidance recommends multiplying the total impact score by the overall probability score to determine the final score for each hazard. A final score between 0 and 12 is considered a low-threat hazard, 12.1 to 42 is a medium-threat hazard, and a score above 42 is considered a high-threat hazard. This final score determines the prioritization of the hazards.



Earthquakes are high priority hazards because they are likely to happen, affect a wide area, and can be very damaging. Image from FEMA (FEMA News Photo).

Table 3-3 shows the individual criterion scores, the final score, and the threat level for each hazard based on the above prioritization process.

TABLE 3-3: HAZARD SCORES AND THREAT LEVEL

Hazard Type	Probability	Impact			Total Score	Hazard Planning Consideration
		Location	Primary Impact	Secondary Impacts		
Seismic Hazards	4	4	4	4	64.00	High
Fire (Urban/Wild)	4	2	3	3	41.60	Medium
Drought	3	4	2	2	33.60	Medium
Severe Weather (Heat, Wind, Rain)	3	4	2	2	33.60	Medium
Dam Failure	2	3	4	4	28.80	Medium
Human-Caused Hazards (Aircraft, Civil Disturbance, Transportation Accidents, Terrorism, Cyber)	3	3	2	2	28.80	Medium
Geologic Hazards (Landslide/Mudflows, Subsidence)	3	2	2	3	27.00	Medium
Flooding	3	2	2	2	24.00	Medium
Hazardous Materials Release)	3	2	2	2	24.00	Medium
Disease/Pests	2	2	2	2	16.00	Medium

HAZARD PROFILES

DAM FAILURE

Description

A dam failure occurs when a dam holding back the waters of a reservoir is no longer able to control the collection of the water. A dam failure could result from a dam breach in which a section of the dam disintegrates, allowing the reservoir's waters to escape. A flood caused by a dam breach can move swiftly and be very powerful. Other hazardous situations, such as a major flash flood or strong earthquake, can trigger a dam failure, especially if the dam is aging or deteriorating. A mechanical malfunction can also cause a dam failure if the dam is not maintained or operated correctly. When assessing dam failure hazards, it is assumed that impacts occur based on a full reservoir.

Location and Extent

Dam inundation maps show areas downstream that would be inundated by water from an unintentional release of water from a dam's reservoir. All owners of High-Hazard Potential (HHP) dams have the legal liability to provide a map of inundation areas as part of an Emergency Action Plan. **Figure 3-1** shows the areas in Fullerton that could flood as a result of dam failure. These maps were created using a combination of LIDAR and field survey, in conjunction with US Army Corps of Engineers software. The areas that could flood in the case of a dam breach are not necessarily the same areas that could be inundated by a 100-year or 500-year flood.

The Army Corps of Engineers uses the Dam Safety Action Classification (DSAC) scale to measure the potential for dam breach. **Table 3-4** shows the DSAC ratings.

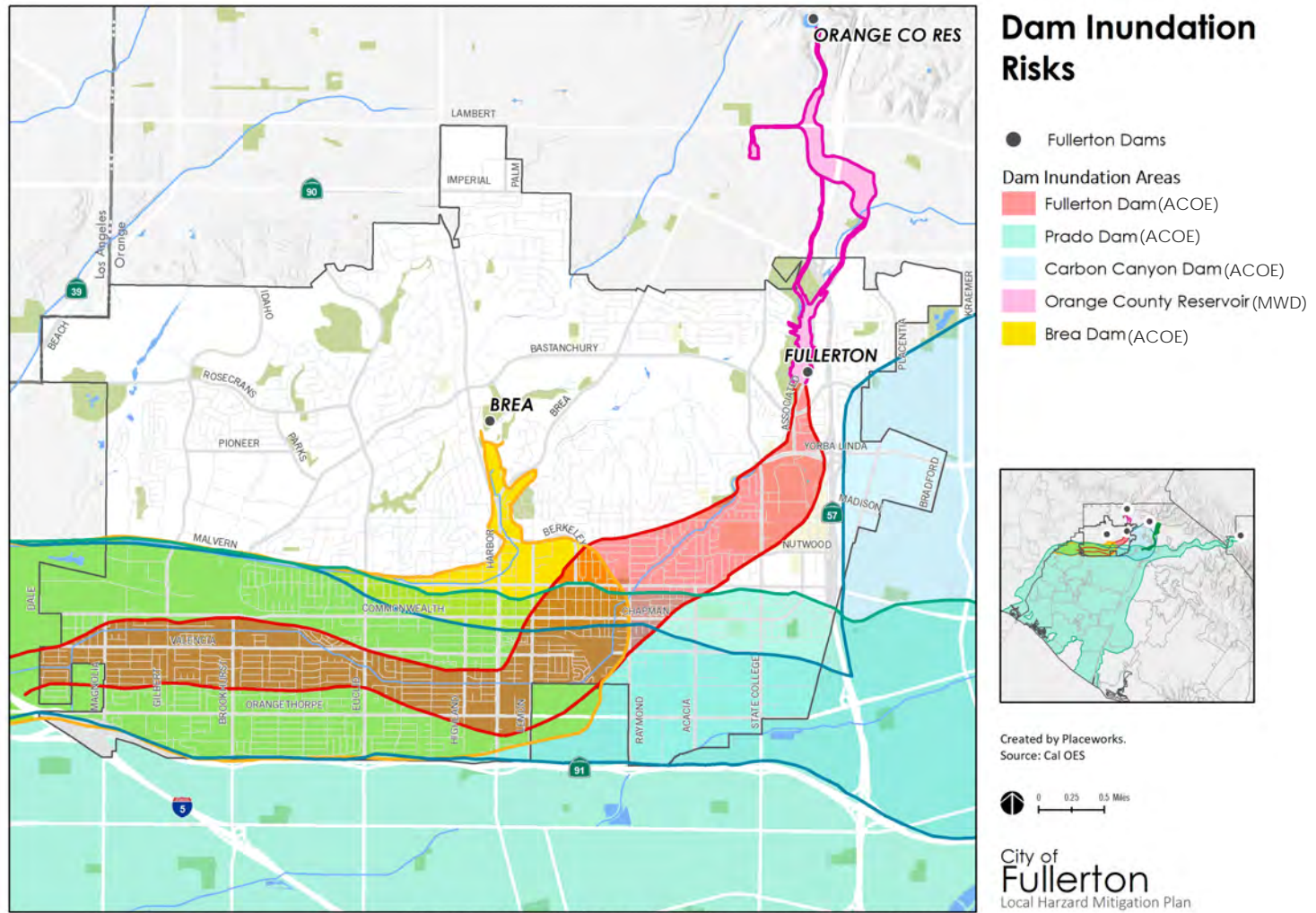
TABLE 3-4: DAM SAFETY ACTION CLASSIFICATION (DSAC) RATINGS

Rating Numeral	Rating Name	Description
I	Urgent and Compelling (Unsafe)	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.
II	Urgent (Unsafe or Potentially Unsafe)	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.
III	High Priority (Conditionally Unsafe)	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.
IV	Priority (Marginally Safe)	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.
V	Normal (Adequately Safe)	Dams considered adequately safe, meeting all essential agency guidelines, and the residual risk is considered tolerable.

Source: Army Corps 2018e.

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Figure 3-1: Dam Failure Inundation Zones



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Past Events

While California's dam infrastructure is fairly recent in the state's history, there have already been major catastrophic dam failure events. One of the earliest in Southern California was the failure of the San Francisquito Canyon Dam. The dam experienced a structural failure as a result of insufficient geotechnical engineering by the then-Los Angeles Bureau of Water Works and Supply. At midnight of March 13, 1928, the 205-foot-tall structure gave way, unleashing a 120-foot-high wave of water traveling 18 miles per hour down the canyon. By 5:30 AM, the wave had traveled 54 miles from the dam site to the Pacific Ocean, killing at least 438 people, razing towns, and destroying infrastructure. It was reported that the bodies of victims were recovered from the ocean as far south as the Mexican border. The disaster is considered one of the worst engineering failures in US history (Dam Safety Officials 2018a; Rogers 2013).



The Brea Dam in Fullerton with the basin partially filled. Image from Fullerton Walks.

Another, more recent, dam failure in the region occurred at the Baldwin Hills Dam. On December 14, 1963, a structural failure in the dam caused a breach that unleashed 250 million gallons of reservoir water. Diligent work by maintenance crews detected the developing failure in the dam four hours before it breached, and they, with the cooperation of local law enforcement, were able to successfully evacuate and save nearly 1,500 people downstream from the reservoir. Five lives were lost in the ensuing wave of water, 65 homes were destroyed, and nearly \$11 million worth of property damage was incurred (Dam Safety Officials 2018b; CLUI 2018).

In Fullerton itself, only one dam incident has occurred, which involved an extensive episode of winter rains in 2005 inundating the Brea Dam reservoir, causing water to spill over its crest. The Fullerton Golf Course and sections of Bastanchury Road were flooded with water, but no lives were lost. The golf course was damaged, and an adjacent storm channel was eroded by the flood waters (Fullerton 2010).

Risk of Future Events

Due to the presence of several dams within and near Fullerton, large areas of the city could be at risk of inundation in the case of significant dam failure. Some of the potential consequences of dam failure are death or injury, people displaced from their homes, damage to existing public and private buildings, damage to infrastructure, loss of services from utilities, loss of government services, and economic losses.

The US Army Corps of Engineers (ACOE) evaluates and rates dams based on confirmed or unconfirmed safety issues, probability of failure, and the potential consequences.

Prado Dam is an earth-filled dam built in 1941 by the Army Corps of Engineers on the Santa Ana River near the city of Corona in Riverside County. It is the primary flood control facility of the Santa Ana River watershed and has an area of approximately 10,000 acres. The Army Corps of Engineers Dam Safety Program has given the dam a DSAC III rating, which means it poses a moderate to high potential for

damage if it fails. Generally, there is water impounded behind the dam during most of the year but during drought events the reservoir can be empty (OCWD 2016; Army Corps 2018a).

Brea Dam is a flood control dam built in 1942 and owned by the Army Corps of Engineers. Located in Fullerton, it controls the flow of water from Brea Creek and its tributaries. This dam and its reservoir are normally empty and intended to detain waters from a rainstorm.

The dam has received a DSAC III rating, which means it poses a moderate to high potential for damage if it fails. The dam has a potential for failure from the erosion of the embankment, overtopping from flooding, and erosion of the flood control channel (Army Corps 2018b).

Carbon Canyon Dam, which completed construction in 1961, is a flood risk management project operated by the Army Corps of Engineers, Los Angeles District. It is near the northern edge of Orange County in Yorba Linda (Army Corps 2018c). The Army Corps of Engineers Dam Safety Program has given the structure a DSAC II rating, which means it means it has a high risk of failure without remediation efforts. The dam has a high potential for failure due to erosion of the embankment (Army Corps 2018c). This dam and its reservoir are normally empty and intended to detain waters from a rainstorm.

Fullerton Dam is a single purpose flood control dam that was built in 1941 as part of the Santa Ana River Mainstem project and is in the eastern section of Fullerton (Army Corps 2018d). The dam was constructed to provide flood risk protection for Fullerton. The dam has a flood risk rating of DSAC IV, which means it is inadequate but poses a low threat to life, the economy, or the environment. The risks of dam failure are related to the potential for seepage and piping along embankment and the outlet conduit (Army Corps 2018d). This dam and its reservoir are normally empty and intended to detain waters from a rainstorm.

The **Orange County Reservoir**, built in 1941, is an earthen-filled dam in the City of Brea. It is owned by the Metropolitan Water District of Southern California and manages water supply. This dam has not been evaluated by the Army Corps of Engineers so there is no corresponding DSAC rating for this facility. This dam and its reservoir are normally empty and intended to detain waters from a rainstorm.

Climate Change Considerations

Climate change could increase the risk of a dam failure. More frequent and intense episodes of rain storms may increase the likelihood that the reservoir infrastructure of California could become overwhelmed, including the dams that control floodwaters from inundating Fullerton and the rest of Orange County. Indirectly, increased climate change-induced rains may cause more erosion which could compromise the structural integrity of the dam or the foundation it sits on.

DISEASE/PESTS

Description

An epidemic is when an infectious disease spreads beyond a local population, reaching people in a wide geographical area. A disease that reaches global proportions is considered a pandemic. The two main categories that impact the spread of disease are the ease with which a pathogen moves from person to person, and the behavior of individuals and societies.



Vaccination is one method to address the threat of diseases in Fullerton. Image from TODAY

Pests are organisms whose presence is seen as a nuisance since they are capable of being vectors for certain diseases. Examples include insects or rodents.

Vector-borne diseases are spread by pests to animals and humans. Sometimes the disease is not spread directly from vector to human but can jump first to an intermediary, like a domesticated animal, where it evolves into a form that can be hosted by humans. These kinds of diseases are referred to as zoonoses.

Diseases and pests of concern in Fullerton include:

- **Influenza (the Flu)** is a virus that leads to illness in humans, with such symptoms as fever, cough, headache, sore throat, muscle and joint pain, or runny nose. It is one of the most common infections worldwide and kills up to 500,000 people each year (WHO 2014).
- **Mosquitoes** are an insect that feeds upon the blood of humans. In so doing, mosquitoes leave itchy bites but can also transmit diseases to their victims. Examples of some of these diseases include West Nile Virus and Zika, though West Nile Virus is the more recurrent of the two.
- **Mice and rats** are pests that can transmit diseases or be a vector for other disease-carrying organisms. The most well-known example of this is Bubonic Plague, which was transmitted by fleas burrowed into the fur of rats and mice.

Location and Extent

Diseases can be spread virtually anywhere and are not bound to specific locations in Fullerton. As long as humans are present in a certain area, there is the potential for disease. Some vector-borne diseases, however, may be more prevalent in certain areas of the city. For example, street catch basins, storm drains, roadside ditches, flood channels, ravines, and similar places on the public right-of-way can put the Fullerton community at risk of mosquito-borne diseases because these places are breeding grounds for mosquitoes (Fullerton 2010). Garbage dumpsters or open waste may also attract mice and rats.

Most diseases do not have a particular scale to measure their severity or extent, with the exception of influenza. Influenza is measured using the Pandemic Influenza Phases scale established by the World Health Organization (WHO). **Table 3-5** shows this scale and describes each phase.

TABLE 3-5: PANDEMIC INFLUENZA PHASES

Phase	Description
Phase 1	No animal influenza virus is known to have caused infection in people.
Phase 2	An animal influenza virus has caused infection in people. There is a potential pandemic threat.
Phase 3	An animal influenza virus has caused occasional infections or infections in small groups. There may be limited human-to-human transmission, but nothing large enough to sustain community-level outbreaks.
Phase 4	Human-to-human transmission is able to sustain community-level outbreaks. There is a significantly higher risk of a pandemic.
Phase 5	Human-to-human transmission in at least two countries in the same region. A pandemic is likely imminent.
Phase 6	Human-to-human transmission in at least two countries in the same region and in at least one other country outside of the region. A pandemic is underway.
Post-peak	Transmission levels are declining below peak levels, although second waves may occur and transmission could return to previous levels or higher.
Post-pandemic	Transmission levels have returned to normal levels for seasonal influenza outbreaks.

Source: WHO 2017.

Past Events

Vector-borne disease and epidemics have struck Fullerton and/or greater Southern California. Some major cases include:

H1N1: The 2009 H1N1 flu virus, also known as the swine flu, caused global health impacts and illustrated the risk of emerging viruses. In Orange County, there were 226 severe³ and 57 fatal cases of the H1N1 virus, tracked by the Orange County Health Care Agency (OCHCA) (OCHCA 2009).

Hepatitis A: There was a hepatitis A outbreak that began in San Diego County in November 2016 and later spread to Santa Cruz, Los Angeles, and Monterey counties. The majority of people infected were homeless persons or those using drugs. In October 2017, Governor Brown issued an emergency proclamation that allows the state to increase its supply of hepatitis A vaccines in order to control the ongoing outbreak (County of San Diego 2018)

Measles: In 2015, a measles outbreak began, linked to Disneyland in Anaheim. The cause of the outbreak was likely a person infected with measles who visited Disneyland and infected other park visitors who were not vaccinated, most of whom were under 18 years old. By the end of 2015, the OCHCA had tracked 35 reported cases. By 2016, however, all cases had been remedied and the number returned to zero (CDC 2015; OCHCA 2017).

West Nile Virus: Between 2013 and 2017, the number of cases of West Nile Virus decreased. The height of West Nile Virus infections was in 2014 with a peak of 280 reported cases. The following year there was a dramatic reduction to 97 reported cases. This trend continued into 2017, when only 38 cases were reported (OCHCA 2017).

Risk of Future Events

All of Fullerton is at risk of being affected by a disease or by pests carrying diseases. While the City and regional jurisdictions can take precautions to reduce the spread of diseases, the spread of disease cannot

³ Severe case being defined as one needing intensive care.

entirely be eliminated. Some diseases such as influenza return every year since the virus that causes influenza evolves very rapidly. Others such as the measles can be contained so long as the general population remains inoculated against the viruses that cause them.

An especially severe flu pandemic could lead to a high number of illnesses, deaths, and hospitalizations. Students who are unvaccinated may be excluded from school for several days, as was the case in 2015 (CDC 2015; OCHCA 2017). Restrictive measures may have to be placed on public transportation, health care, food delivery, or other services that could potentially spread the disease.

Climate Change Considerations

Climate change is expected to bring warmer temperatures to Fullerton, which may cause the insects, pests, and other vectors that carry disease to remain active for a larger part of the year. This could likely lead to an increase in the threat of exposure. Furthermore, pathogens and vectors not currently in Fullerton may migrate into the area in association with the warmer temperatures. As an example, mosquitoes contaminated with yellow fever, dengue fever, and Zika now have an extended range, not seen previously, due to climate change (Mckenna 2017). It is also anticipated that warmer winters will increase the number of early and severe epidemics (Towers 2013).

DROUGHT

Description

A drought is a long period during which precipitation levels are significantly below normal. The most common effect is that plants dry out and become more susceptible to agricultural pests or diseases. An abundance of dry plant matter may also increase the risk of wildfires or cause fires to be more intense.

In severe cases, droughts can affect urban areas. A significant drought can lead to water shortages, which may force local water suppliers to institute mandatory restrictions on nonessential water use. In extreme cases, there may not be enough water to meet basic health and hygienic needs, requiring communities to find alternative water supplies. Since many communities receive their water from far-away sources, such as the Sierra Nevada or Colorado River, it is common in California to experience “long-distance droughts,” where precipitation levels may be normal in the community itself, but low at the source of the community’s water.

Location and Extent

Droughts are large-scale events, and so drought risks and conditions are generally equal across all of Fullerton. Furthermore, since Fullerton sources approximately 30 percent of its water non-locally, a drought in those areas could impact Fullerton as well. When precipitation levels are normal or above normal in Fullerton, a drought in the areas where Fullerton’s water comes from can still affect Fullerton’s residents.

The US Drought Monitor Classification Scheme is a common scale used to measure the impact of droughts in different communities across the United States. See **Table 3-5** for a complete description of each drought event classification.

TABLE 3-6: US DROUGHT MONITOR CLASSIFICATION SCHEME

Category	Description	Possible Impacts
D0*	Abnormally dry	Slower growth of crops and pastures.
D1	Moderate drought	Some damage to crops and pastures. Water bodies and wells are low. Some water shortages may occur or may be imminent. Voluntary water use restrictions can be requested.
D2	Severe drought	Likely crop and pasture losses. Water shortages are common, and water restrictions can be imposed.
D3	Extreme drought	Major crop and pasture losses. Widespread water shortages and restrictions.
D4	Exceptional drought	Exceptional and widespread crop and pasture losses. Emergency water shortages develop.

Source: US Drought Monitor 2018a.

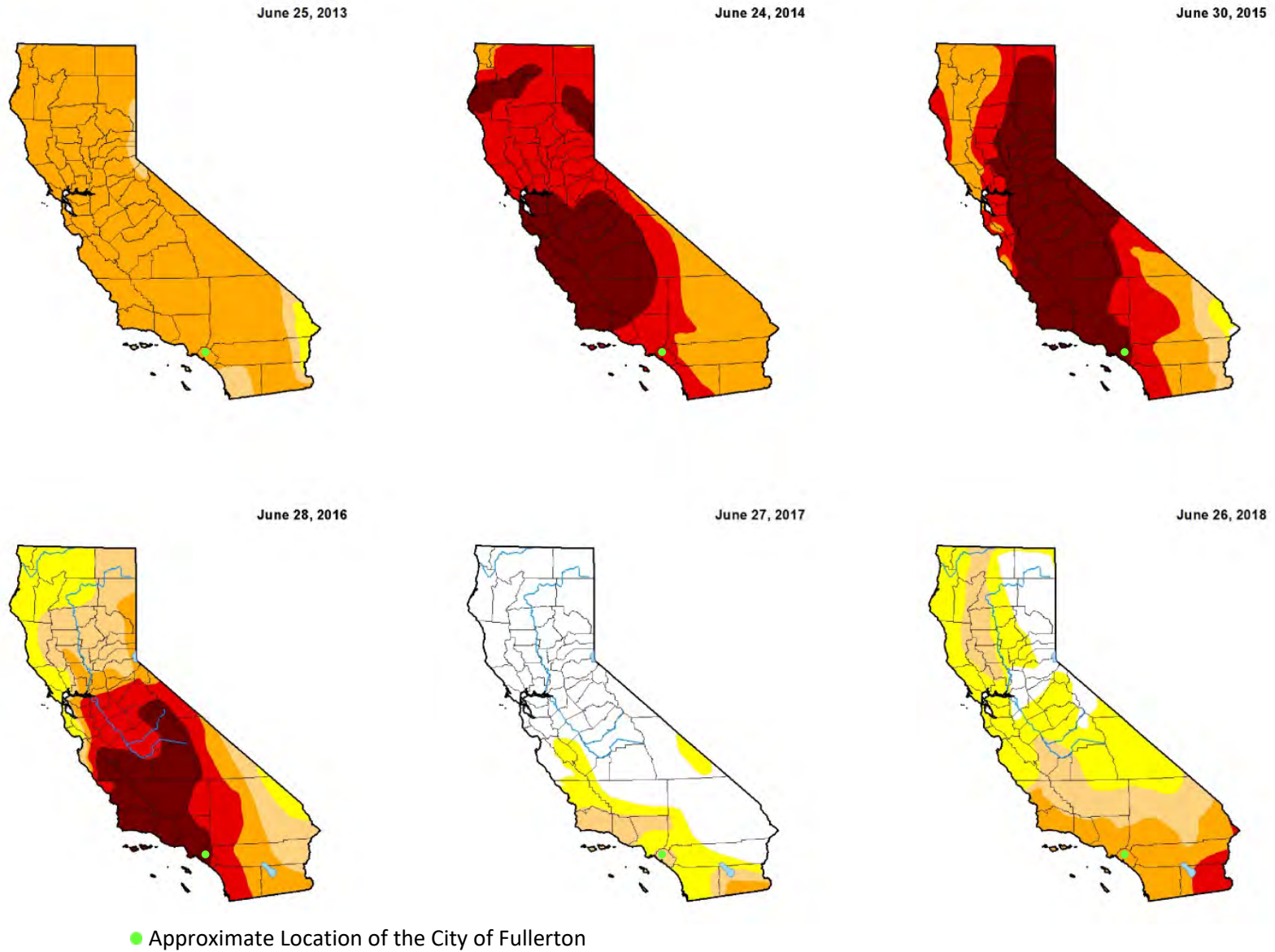
* D0 areas are those under “drought watch” but not technically in a drought. They are potentially heading into drought conditions or recovering from drought but not yet back to normal.

Past Events

Fullerton, like the rest of California, has experienced numerous droughts over its history. Each drought event has varied in its length, severity, and frequency. One of the earliest recorded droughts in settled California history is the “Great Drought” of 1863 and 1864, which led to the decline of California’s cattle industry. From 1928 to 1935, the “Dustbowl Droughts” greatly affected the state’s agricultural sector, setting the stage for the development of water infrastructure like the State Water Project and the California Aqueduct. Contemporary statewide water conservation practices have their roots in a severe drought that began in 1976 and ended in 1977. More recent droughts occurred from 1987 to 1992 and in the first decade of the 21st century, from 2007 to 2009 (Cal OES 2018; Kotin and Marion 2014; DWR 2015).

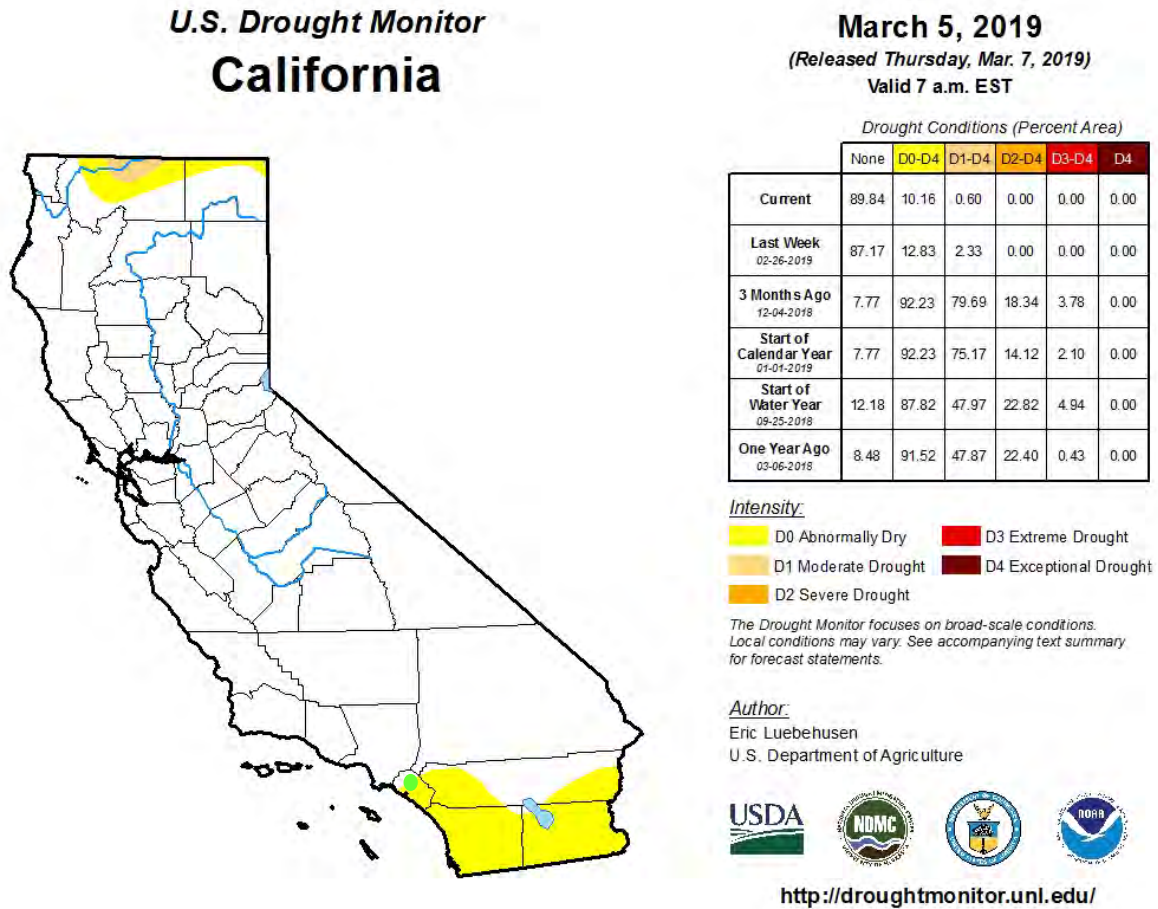
The most recent drought in California’s history was also one of the most severe, beginning in 2012 and ending in 2017. All areas of the state were affected by the drought, and by its second year it was already determined to be the worst drought on record in the last 1,200 years (Griffin and Anchukaitis 2014). By summer 2014, nearly the entire state was experiencing D2 (severe drought) conditions. Fullerton, all of Orange County, and more than 75 percent of California was ranked as having D4 (extreme drought) conditions. Water-saving mandates from the State were in place by 2015, which required all municipalities, including Fullerton, to reduce their water consumption rates by 25 percent (Megerian et al. 2015). Heavy rainfall in the winter of 2016-2017 effectively ended the drought across the state (Boxall 2017), although low levels of precipitation in the winter of 2017-2018 have caused a return of more moderate drought conditions across large sections of California. **Figure 3-2** shows the progression of the drought starting in the summer of 2013 and ending with the most recent drought conditions.

Figure 3-2: Statewide Drought Conditions from 2013 to 2018



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Figure 3-3: Statewide Drought Conditions as of March 5, 2019



As of March 2019, approximately 1 percent of California was experiencing at least D1 (Moderate Drought) conditions, and approximately 10 percent of the state was experiencing at least D0 (Abnormally Dry) conditions, which usually is considered to be a “drought watch” period. Large sections of Southern California, including most of Orange County, were experiencing D0 (Abnormally Dry) or greater conditions. **Figure 3-3** shows statewide drought conditions as of March 5, 2019.

Risk of Future Events

As droughts are expected to continue across California, it is also anticipated that droughts and drought conditions will continue to occur in Fullerton. Areas of concern where drought could impact the community, include vegetation within natural areas and landscaped areas (parks, medians, managed open space areas).

Climate Change Considerations

Climate change is anticipated to affect water supply in Fullerton. Much of Southern California’s water supply comes from the snowpack of the Sierra Nevada in Northern California. It is expected that a warming climate will melt the Sierra Nevada snowpack sooner into the year, shortening the amount of time that the snowpack remains into the spring and summer seasons. Warmer temperatures are also expected to

cause more precipitation to fall as rain rather than snow, further decreasing the size of the snowpack. As a result, it is likely that less water will be flowing into the reservoirs and aqueducts that supply Southern California. This could add stress to the City's water supplies, potentially putting more stress on existing groundwater resources within the region. Climate change is projected to cause an increase in the frequency and intensity of extreme precipitation events, which includes droughts as well as intensive flooding. Additionally, hotter temperatures are expected to increase demand for water supply for landscape maintenance in urban areas. Fullerton's natural areas in the Coyote Hills are likely to be at risk of being negatively impacted by more frequent and severe droughts in the future.

FIRE

Fire hazards occur when fuel, such as dead vegetation, industrial materials, or buildings, ignite and catch fire. Without human intervention, fire hazards can spread rapidly and affect large swaths of land, both wild and developed. In general, there are two kinds of fires: urban and wild.

Description

Urban fires: Urban fires are fires that emerge in developed areas of a community or city. Generally, these fires affect residential properties, businesses, public spaces, and government facilities. They are capable of inflicting heavy damage, injury, or even death. Urban fires have a number of causes, but some example ignition sources include: downed power lines, breached gas pipelines, improper storage of hazardous or flammable material, or lack of building maintenance. Urban fires may also be intentionally started through arson.

Wildfires: Wildfires begin in natural, undeveloped land. Wildfires sometimes ignite due to natural circumstances, such as intense heat combined with masses of dead vegetation, or lightning strike. Dry vegetation is highly combustible when the weather is hot and dry. Fires can also ignite under windy conditions from the friction caused by vegetation rubbing together. Humans can also start wildfires, either intentionally or unintentionally. A downed power line in a wind event, for example, could catch the surrounding landscaping or buildings on fire, or an unextinguished cigarette tossed into dry grass may ignite and cause a wildfire. Sometimes humans intentionally burn wild landscapes, often for land management purposes.

Topography can play a role in influencing the speed and direction of a wildfire. Because heat rises, fires move faster uphill, so a steep slope can make a fire spread faster. Thus, fires are a greater risk in mountainous areas.

The space between the urban and wild zones of land is referred to as the Wildland-Urban Interface (WUI). The WUI is where the fringe of an urbanized region meets natural landscapes. While some of the land in the WUI has been developed, there is likely to be wildland in the periphery containing vast quantities of fuel that could ignite. The residents and property owners in these areas are most at risk for incurring property damage or suffering physical harm from fires.

In California, fires are one of the most common hazards in the state, with nearly 5,400 wildland fires and more than 156,000 acres burned between 2011 and 2015 alone (CAL FIRE 2018a).

Location and Extent

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 risk level for wildland areas with an elevated chance of wildfires is measured using a three-tier scale of fire hazard severity zones (FHSZs)—very high, high, and moderate. Areas at elevated risk of fire are also classified by the corresponding fire response jurisdiction. Federal Responsibility Areas (FRAs) are under the purview of the United States government, including such agencies as: the US Forest Service, the Bureau of Land Management, and the National Park Service. State Responsibility Areas (SRAs) are governed by the California Department of Forestry and Fire Protection (CAL FIRE), and Local Responsibility Areas (LRAs) are responsibility of local governments, such as counties and municipalities. **Figure 3-4** shows areas in Fullerton are designated fire hazard severity zones.

All of Fullerton is potentially at risk of some type of fire hazard. Since 90 percent of the City's land is currently built-out, mostly with wooden-frame construction (Fullerton 2012b), there is potential for fires to emerge at any location in the city. Several rights-of-way bisect Fullerton, including freeways and railroads. It is possible that an auto collision or rail incident could start a fire that could spread to any of the developments adjacent to the right-of-way. Additionally, Fullerton's location next to Carbon Canyon and Puente Hills—places where fires are prone to erupt, according to CAL FIRE—means that a fire could start in one of these undeveloped areas and spread to or affect nearby communities, including Fullerton (CAL FIRE 2011b).

Wildfires are a greater risk where there is a diversity of materials that can fuel a fire (OC HMP 2015). The construction of residential development near undeveloped land covered in chaparral, such as in the East and West Coyote Hills, creates a condition highly prone to wildfires (RSG 2018). Many species of chaparral are coated with flammable oils and resins. The presence of this type of brush in Southern California's natural areas makes the region as a whole at risk of wildfires (NPS 2018).

The East and West Coyote Hills have been designated a very high FHSZ by CAL FIRE (CAL FIRE 2011a). These hills are one of the few remaining open spaces in Fullerton. Other sections of the city have been designated high and moderate FHSZ. These areas include residential developments at the base of the West Coyote Hills and the area surrounding Brea Dam. The St. Jude Medical Center, as well as several City-owned or -operated youth facilities, are also within this elevated fire risk area.

Santa Ana winds, a weather phenomenon described in detail in the "Severe Weather" section are known to exacerbate fire conditions in California. Because Santa Ana events generally occur in the fall and winter seasons, the time when there is usually the greatest amount of fuel available for fires in Southern California, they are particularly dangerous (Abatzoglou et al. 2013). Given Fullerton's position between the coast and the inland areas combined with the fuel found in the adjacent Puente Hills and Carbon Canyon, the city is at risk of being impacted by fires amplified by the Santa Ana winds.

Past Events

Some of the most recent fires have also been the largest. In fact, the top five largest fires in California have all occurred since the year 2000 (See **Table 3-7**).

TABLE 3-7: TOP FIVE LARGEST FIRES IN CALIFORNIA SINCE 2000

Fire Name	Date	Acres Burned	Structures Razed	Deaths
Mendocino Complex	July 2018	459,123	280	1
Thomas	December 2017	281,893	1,063	2
Cedar	October 2003	273,246	2,820	15
Rush	August 2012	271,911 (in-state), 43,666 (out-of-state)	0	0
Rim	August 2013	257,314	112	0

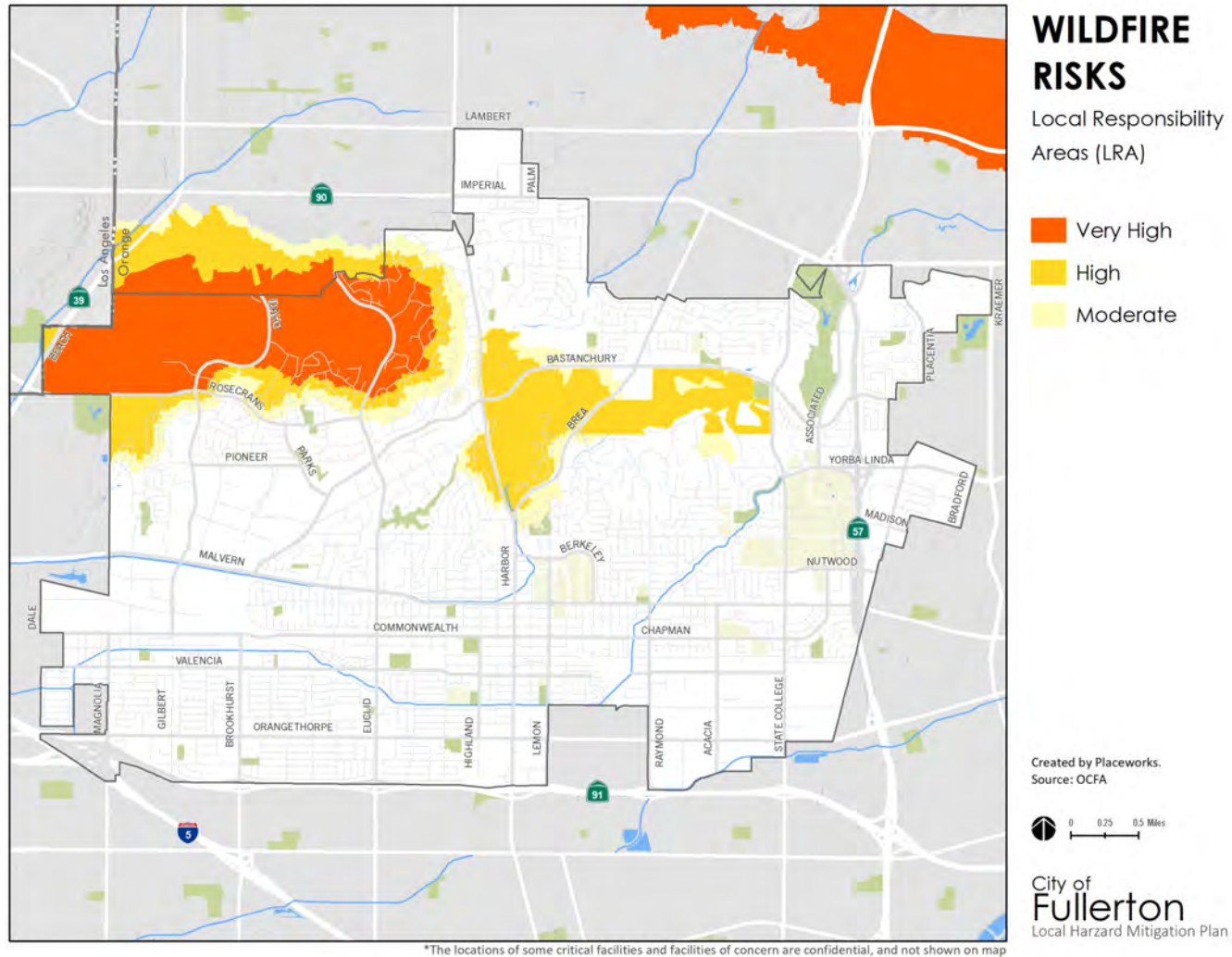
Source: CAL FIRE 2018b.

In November 2008, dry conditions and Santa Ana Winds ignited the “Freeway Fire” in Corona which was spread by Santa Ana Winds in excess of 60 mph across the region, including the neighboring Orange County communities of Yorba Linda, Brea, and Anaheim. Upon containment, it was determined that more than 30,000 acres of land had been scorched, 381 buildings burned, and numerous city and state parks destroyed (OCFA 2018). Between the fall and winter months of 2017-2018, a torrent of fires swept across wildland and urban areas in both northern and southern California. They included the Thomas Fire, which burned through 281,893 acres in both Ventura and Santa Barbara Counties, and at the time was California’s largest known wildfire. (It was surpassed by the Mendocino Complex wildfires seven months later.) Multiple wildfires also burned in the northern San Francisco Bay Area during this time, which collectively were the deadliest wildfires in California’s history (CAL FIRE 2018b). Communities near Fullerton were also affected when “Canyon Fire 2” began October 9, 2017 in the neighboring Anaheim Hills and went on to burn 9,217 acres, destroying 25 structures and damaging 55 others. The fire was contained more than a week later on October 17 through multijurisdictional cooperation between CAL FIRE, Orange County Fire Authority, California Highway Patrol, Orange County Sheriff, Caltrans, SoCalGas, and many local fire and police departments (CAL FIRE 2018c).



Santa Ana Winds from the Great Basin are known to contribute to wildfire risk.

Figure 3-4: Fire Hazard Zones



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Fullerton has also seen smaller-scale urban and wildfire events in recent years. In 2015, following a prolonged period of drought throughout the state, a wildfire burned through dry vegetation near the Brea Dam, causing evacuations of the Fullerton Sports Complex and Fullerton Golf Course (Vives 2015). Between 2016 and 2017, it was suspected that a serial arsonist was igniting a series of fires in trash bins in Fullerton. There were more than 15 such fires ignited in a five-month period (CBS Los Angeles 2017) In August 2017, a condominium complex in Fullerton caught fire during the night, causing damage to all three units. The complex was evacuated, and although nobody was injured, the fire caused nearly \$200,000 in property damage (Schwebke 2017). In December 2017, a small, half-acre brush fire erupted in Fullerton causing damage to one building. No injuries were reported, and multiple agencies responded to the fire from surrounding local and county jurisdictions (Patch 2017).

Risk of Future Events

There is nothing to suggest that the frequency of fires in Fullerton will diminish in the future. The mostly built-out nature of the city indicates that it is likely that buildings will continue to catch fire. Fullerton's recent history with arson in 2015 indicates that more arsonists could emerge in both the near- and long-term future. The various natural and undeveloped areas both within and around the City also present the risk that a wildland fire could ignite and affect Fullerton.

Climate Change Considerations

Climate change is expected to exacerbate fire hazards by creating more of the conditions under which they begin. With climate change, overall temperatures and the likelihood of drought in Fullerton will increase, leading to an increased amount of dry vegetation. More intense rain storms as a result of climate change may also create more fuel for wildland fires to burn through. Climate change is also likely to lead to more severe weather events, involving Santa Ana winds which will exacerbate wildfire risk. The link between climate change and urban fire is not well understood, but it is feasible that a severe, climate change-intensified drought could lead to limited water supplies, reducing the effectiveness of firefighting crews responding to urban fires in Fullerton.

FLOOD

Description

A flood occurs when land that does not normally have bodies of water becomes suddenly inundated with water. Flooding can occur after periods of heavy rainfall, whether it occurs as a single extreme episode or as a series of storms. Drainages and stream courses may flood their banks and shores if their capacity is exceeded by rainwater. When heavy rainfall hits an area where the ground is already saturated, the risk of flooding is high. In developed areas, the presence of pavement and other impervious surfaces means that the ground is less able to absorb water. As a result, rainwater must be carried away in storm channels or waterways.

Floods pose a number of threats to communities and public safety. Flooding can cause property damage, destroy homes, and carry away vehicles or other large debris. Topsoil and vegetation can be swept away by floodwaters, leading to erosion. Floodwaters may impede the movement of victims fleeing a flood or of first responders attempting to reach people in need of help.

Location and Extent

Flood events are measured by their likelihood of occurrence. For instance, a 100-year flood is a flood that has a 1 in 100 (1.0 percent) chance of occurring in any given year. A 500-year flood is a flood that has a 1 in 500 (0.2 percent) chance of occurring in any given year. The 100-year flood has been designated as the benchmark for major flood events, and thus 100-year floods are referred to as “base floods.”

Floodplains are areas that experience frequent flooding. While it is possible for areas outside of these designated floodplains to experience flooding, the areas most likely to experience future flooding are low-lying areas near bodies of water. FEMA is the governmental body responsible for designating which areas of the United States can be classified as floodplains. The three most common designations are:

- Special Flood Hazard Area: The area within a 100-year floodplain.
- Moderate Flood Hazard Area: The area outside of the 100-year floodplain but within the 500-year floodplain.
- Minimum Flood Hazard Area: The area outside of the 500-year floodplain.

Within these three designations, FEMA has multiple floodplain categories for each unique environment.

Table 3-8 shows these detailed floodplain categories.

TABLE 3-8: FEMA FLOOD PLAIN CATEGORIES

Category	Description
A	Within a 100-year flood plain, but the water height of the 100-year flood is not known.
A1-30 or AE	Within a 100-year flood plain and the water height of the 100-year flood is known.
AO	Within a 100-year flood plain, and the water height of the 100-year flood is between one and three feet but not specifically known.
A99	Within a 100-year flood plain, protected by flood protection infrastructure such as dams or levees.
AH	Within a 100-year flood plain, and the water height of the 100-year flood is between one and three feet and is specifically known.
AR	Within a 100-year flood plain, protected by flood protection infrastructure that is not currently effective, but is being rebuilt to provide protection.
V	Within a 100-year flood plain for coastal floods, but the water height of the flood is not known.
V1-30 or VE	Within a 100-year flood plain for coastal floods and the water height of the flood is known.
VO	Within a 100-year flood plain for shallow coastal floods with a height between one and three feet.
B	Within a 500-year flood plain, or within a 100-year flood plain with a water height less than one foot (found on older maps)
C	Outside of the 500-year flood plain (found on older maps)
X	Outside of the 500-year flood plain (found on newer maps)
X500	Within a 500-year flood plain, or within a 100-year flood plain with a water height less than one foot (found on newer maps)
D	Within an area with a potential and undetermined flood hazard.
M	Within an area at risk of mudslides from a 100-year flood event.
N	Within an area at risk of mudslides from a 500-year flood event.
P	Within an area at risk of mudslides from a potential and undetermined flood event.
E	Within an area at risk of erosion from a 100-year flood event.

Source: CFR 2016.

In Fullerton the 100-year floodplain is not a contiguous area but consists instead of various pockets across the city. These include a residential area northeast of the intersection of I-5 and SR-91, a swath of land abutting Bastanchury Road between Parks Road and W Malvern Avenue, and other small pockets throughout the Coyote Hills. 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. **Figure 3-5** shows the mapped flood hazard zones for 100-year and 500-year flood events in Fullerton.

Floodplain mapping studies are provided by the National Flood Insurance Program. Fullerton participates in the program by adopting FEMA-approved floodplain studies, maps, and regulations. These studies may be funded through federal grants; state, city, and regional agencies; and private parties. The program is designed for flood insurance and floodplain management applications.

Public comments from the online survey suggest that flooding and ponding, has been known to occur following a rainstorm on the following major thoroughfares:

- 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

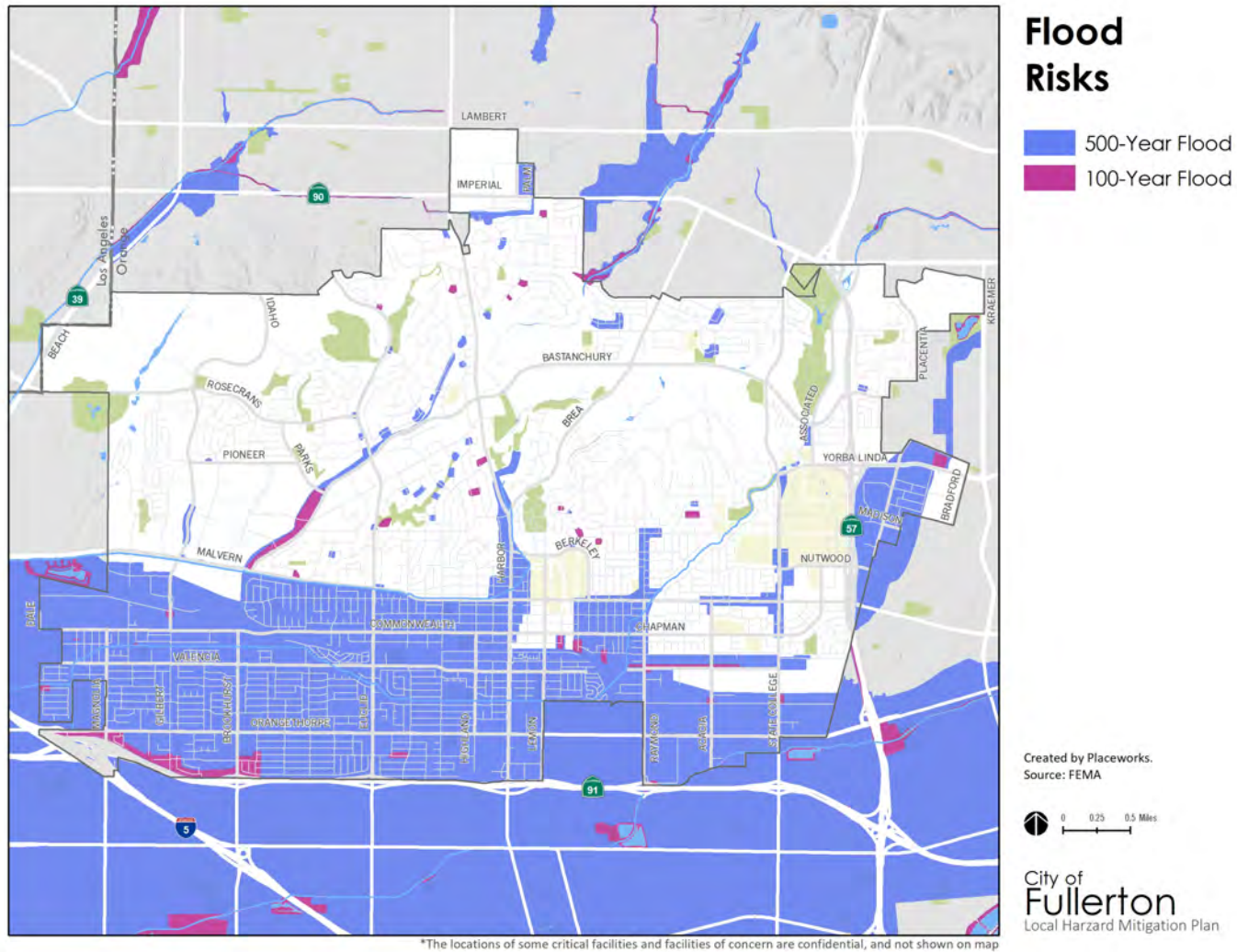
Flooding and ponding was also reported on several smaller, residential streets in Fullerton, including:

- 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.

Other reported flooding locations from the online survey can be viewed in the complete survey results section of this Plan (**Appendix B**). Generally, these eyewitness accounts help characterize flooding at a scale that may not always show up in FEMA floodplain mapping.

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Figure 3-5: FEMA Flood Zones



Map includes Letters of Map Revision through February 23, 2018

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Past Events

Southern California is a semiarid region with inconsistent storm seasons and naturally shallow river channels. It was historically prone to floods that affected the entire region after long periods of rain. The largest flood in the Southern California region was in 1938, when several inches of rain fell over three days, causing rivers across the region to overflow. The Santa Ana River overflowed, flooding areas in Fullerton and Anaheim. The Fullerton and Brea dams were constructed in the aftermath of this particular flood, with money from the Works Progress Administration. Widespread flood-caused destruction across Southern California led numerous local governments to pursue a campaign of concretizing river beds, including rivers and creeks in Orange County, to prevent erosion. The following is a list of recorded flood events in Fullerton and Orange County (NOAA 2018a, 2010; Serna et al. 2015):

- 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.
- Heavy rains in January 1916 caused 22 deaths, widespread flooding, and the destruction of a number of boats moored at Newport Beach.
- The most extensive flooding in Southern California history occurred in late January 1916, when 8 to 58 inches of rainfall were recorded in various measuring stations across the region. Numerous dams breached, resulting in property damage and loss of life. Four people died in Orange County.
- In 1922, heavy rains flooded various rights-of-way across the region, and the Santa Ana River exceeded its normal surface elevation by three feet.
- In 1922, a six-day-long period of rain dropped as much as 25 inches of rain in some locations across Southern California. Fullerton was inundated with floodwaters, as were other major cities, such as Anaheim and Long Beach.
- Heavy rains on New Year’s Eve and Day of 1934 impacted cities across Southern California. Fullerton recorded more than 6 inches of rainfall. In total, 45 people lost their lives, and some canyons became inundated with floodwaters 10 feet high.
- A 1937 rainstorm in February deposited 4.25 inches of rain in nearby Long Beach. A few people were killed in the ensuing flooding, and some dams failed across the region.
- In 1938, the deadliest flooding event in Southern California history was caused by a tropical storm. Up to 30 inches of rain fell in the mountain areas, including 22 inches at the point of origin for the Santa Ana River watershed. In Orange County, 45 died, including 43 in Atwood (now part of present-day Placentia). Fullerton and the rest of northern Orange County were inundated with floodwaters.
- In 1939, a tropical storm brought heavy rain to all of Southern California, resulting in 45 deaths on land and 48 more deaths at sea.

- In November 1960, heavy rains inundated northern Orange County, resulting in one death. The resulting floodwaters damaged property and disrupted electricity service.
- In November 1963, heavy rains fell on Southern California. More than three inches were recorded in coastal Orange County locations. The flooding injured 6 people.
- A December 1964 rainstorm caused flooding that killed 40 people across Los Angeles and Orange Counties.
- Heavy storms in November 1965 dropped between 16 and 20 inches of rain in the mountains of Southern California, causing regional flooding and 15 deaths.
- More than 4 inches of rain fell in the mountains during an April 1988 rainstorm, and floodwaters inundated roadways across Southern California.
- Heavy rains in February 1993 caused flooding and road closures in Orange County.
- In January 1995, flooding inundated the region, causing an estimated \$55 million in property damage and prompting a federal disaster declaration.
- In February 1998, all of Southern California was impacted by heavy rains when 2 to 5 inches fell across the region. Many roads and bridges were washed away or destroyed, and widespread power outages occurred. Property damage reached \$100 million worth, and two people lost their lives.
- In March 2003, 3 to 7 inches of rain fell on Southern California, causing region-wide flooding. Water reached depths of up to three feet on some roadways, causing over 1,000 vehicle collisions.
- In January 2010, a strong storm delivered by the jet stream caused urban flooding throughout Southern California. A medical facility in nearby Santa Ana saw its roof cave in due to the heavy rain.
- In 2014 heavy rains affecting most of Southern California caused flooding on a section of Bastanchury Road that was nearly a foot deep. Nearby weather stations reported that more than an inch of rain had fallen in a span of three hours.
- In September 2015, flooding of roadways caused severe traffic congestion across Southern California, including Orange County. In the City of Los Angeles, 7,300 people lost power for most of the day, and there more than 500 traffic collisions across the entire region as a result of the road conditions.

Risk of Future Events

There is no indication that the severe rainfall that leads to flooding will abate in the future, either in Fullerton or the greater region of Southern California. While Fullerton may experience prolonged periods of dry or wet years, flood events will likely continue to impact the city.

Climate Change Considerations

Climate change is expected to alter the frequency of intense precipitation events throughout California, including Fullerton. Intense rainfalls are expected to occur more frequently (perhaps twice as often by the end of the 21st century) and potentially drop more rain (up to 40 percent more). These projected changes likely mean that Fullerton will experience more frequent and more intense flooding, potentially leading to erosion, dam failure, tree mortality, and other potential hazards.

GEOLOGIC HAZARDS

For the purposes of this plan, geologic hazards include landslides and subsidence.

Description

Landslide: Landslides occur when earth on slopes become destabilized, typically after heavy rains, when the precipitation saturates the soil and makes it less stable, or when significant erosion from rainfall destabilizes the ground. Slopes that have recently burned face a greater risk from rain-induced landslides, as the fires burn up many of the trees, brush, and other vegetation that help stabilize the earth. Earthquakes may also be a source of landslides as the shaking can destabilize already loosened soils.

Subsidence: Subsidence occurs when the level of the ground decreases, as if the surface is sinking. Subsidence can either be sudden (as in a sinkhole) or happen gradually over time. It can be caused by mining, groundwater pumping, or fossil fuel extraction, creating empty underground spaces that can collapse and cause the soil above to drop. Erosion, natural cave collapses, and seismic activity can also cause subsidence.

Location and Extent

Landslide: There is the potential for landslides in the steeper portions of the East and West Coyote Hills area due to the sloping topography. Even these areas, however, are designated as having a moderately low risk of landslides due to seismic conditions, and a low likelihood of a landslide under other conditions (Dept. of Conservation 1976). While no definitive scale for measuring landslides exists, landslide events are usually measured using the amount of material that is displaced (i.e. the cubic feet of earth that moved). **Figure 3-6** shows the areas in Fullerton that are susceptible to landslides. The California Geological Survey has developed a scale of landslide susceptibility that is based on slope steepness and the strength of the underlying rock, with 0 being no susceptibility and 10 being the highest susceptibility. For the purposes of this Plan, an area with a susceptibility of 7 or above is considered a high-risk area.

Subsidence: The City has identified that the most likely locations for subsidence in Fullerton are the northern and central portions of the city. Other sections of the city are potentially subject to subsidence in the event of a major earthquake (M_w 5.0 or greater), although Fullerton does not have a history of seismically induced subsidence (Fullerton 2012c). In terms of extent, subsidence is typically measured by the distance that the ground has sunk from its original elevation (i.e., in feet or inches) or by using the rate of subsidence (i.e., inches or centimeters per year).

There is evidence of subsidence in the southern section of Fullerton and most of Orange County as a result of excessive groundwater pumping in the first half of the 20th century, prior to the development of the

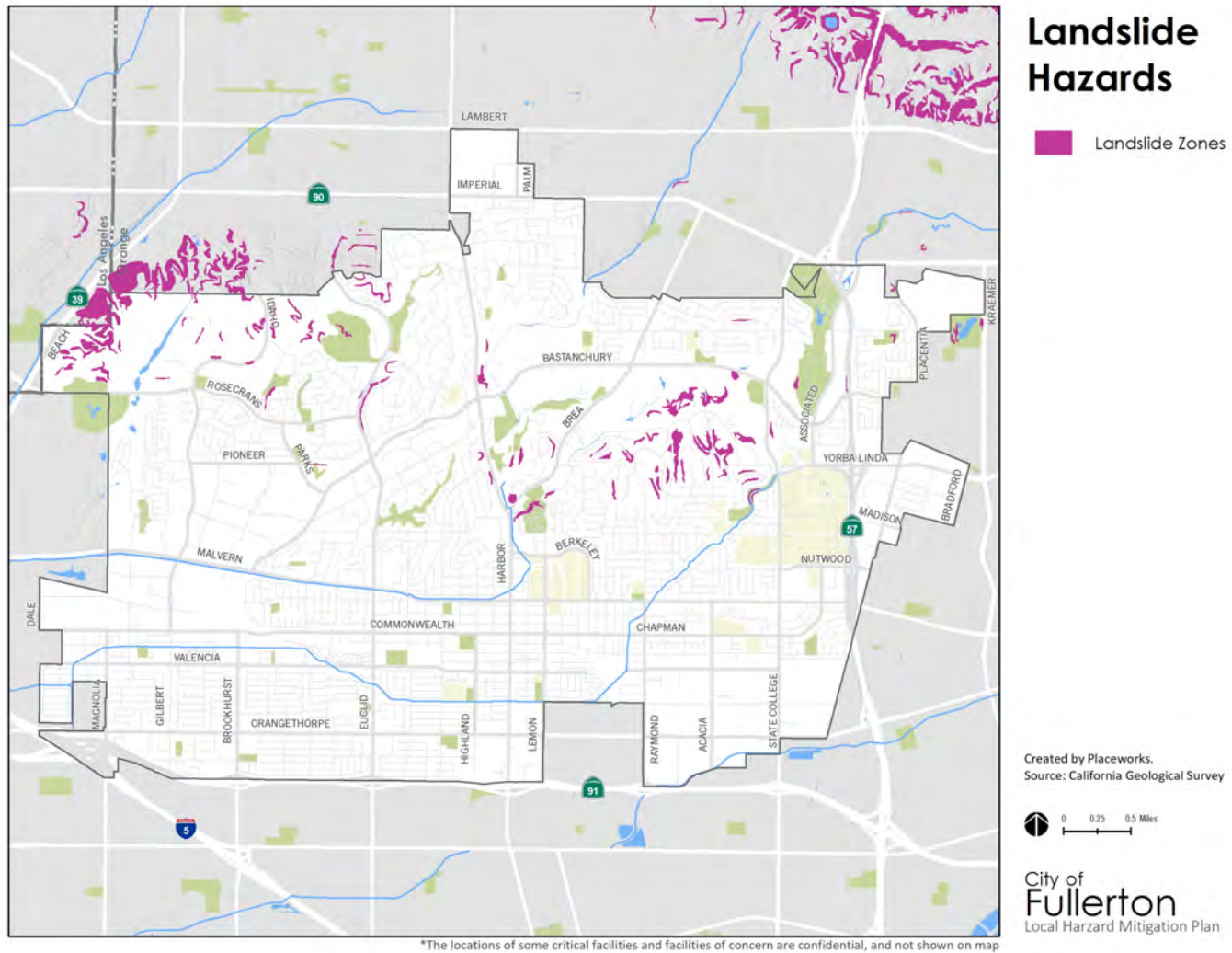
California State Water Project, which siphons water from the Owens Valley (USGS 2018a). Now that local groundwater reserves are replenished regularly, subsidence activity in this area is less likely to occur (Fullerton 2015).

Past Events

Landslide: Major landslides have occurred throughout the Southern California region. For example, landslides were set off by the 1971 San Fernando and 1994 Northridge earthquakes (Dept. of Conservation 1997). Since its founding, Fullerton itself does not have an extensive history of landslide events. 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 (Fullerton 2010). City staff have determined that other landslides occurred prior to Fullerton's establishment, but it is not known exactly when these landslides occurred or the degree of their impact, if any.

Subsidence: According to data from the USGS, there are records of historical and current subsidence in the lower section of Fullerton as a result of excessive groundwater pumping in the first half of the 20th century, as discussed above. Due to the decreased reliance on local groundwater aquifers, the overall risk of subsidence has decreased since the 20th century, though some areas of Orange County are reported to be subsiding at historically high rates of more than one foot per year (USGS 2018a).

Figure 3-6: Landslide Hazards Map



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Risk of Future Events

Landslide: Since most of Fullerton is on flat terrain, the likelihood of a landslide is low. The East and West Coyote Hills, however, have the potential for landslide events, given their topography. Seismic activity in the region also has the potential to start landslides, though it should be noted that seismic shaking in Fullerton has thus far generated no known landslide events. Destabilization of slopes and hills due to intense rainstorms also has the potential to cause future landslides. Fires on the Coyote Hills could cause soil otherwise anchored by vegetation to become loosened and therefore more susceptible to becoming part of a future landslide. Overall the probability of future occurrence within Fullerton is considered occasional.

Subsidence: Since Fullerton does not have a track record of subsidence events, it seems unlikely that subsidence will occur in the city's future. As long as the possibility exists, however, for a subsidence event to occur, Fullerton could potentially be at risk. Given Fullerton's ongoing history with petroleum extraction, it is possible that these activities could hasten the arrival of a subsidence event. Similarly, the possibility of an extreme drought in the future could lead to intensified groundwater withdrawals from the local water table which could also cause future subsidence. Fullerton's potential for a significant earthquake also means that the city could experience seismically induced subsidence in the future.

Climate Change Considerations

Landslide: Due to the variety of factors that lead to landslides, it is possible that climate change could indirectly affect the conditions for landslides. More frequent and more intense rains may cause more moisture-induced landslides. Warmer temperatures and more frequent drought conditions may lead to more fires, which could destabilize soils and make future landslide events more likely.

Subsidence: The relationship between climate change and subsidence is not well established. Nevertheless, it is possible that climate change could indirectly influence subsidence in Fullerton. More intense rainstorms could potentially recharge underground aquifers, which could reduce the risk of subsidence. On the other hand, more severe and prolonged periods of droughts may encourage more groundwater withdrawals and increase the risk of subsidence.

HAZARDOUS MATERIALS RELEASE

For the purposes of this Plan, this section discusses all nonnuclear and nonradiological hazardous materials release events. Events relating to the release of radiological material were determined to not be relevant in this Plan.

Description

Hazardous materials release refers to a hazard event whereby harmful concentrations of hazardous or toxic substances are released into the environment. Such instances usually occur when storage containers of hazardous materials leak or fail. This can happen because of industrial accidents, vehicle crashes, as a consequence of other disasters (e.g., a flood or earthquake), or as a deliberate act.

The threat that hazardous materials pose to human health depends on the type of material, frequency and duration of exposure, and whether chemicals are inhaled, penetrate skin, or ingested, among other

factors. Exposure to hazardous materials can result in short term or long-term effects, including major damage to organs and systems in the body or death. Hazardous materials could also cause health risks if they contaminate soil, groundwater, and air, potentially posing a threat long after the initial release.

Oil and Gas Operations

Oil and gas operations can cause air pollution, groundwater contamination, or odor nuisances that affect surrounding neighborhoods. Major spills and explosions sometimes occur at oil and gas facilities, potentially causing acute or chronic health effects in the aftermath. Oil and gas well operations can emit toxic chemicals into the air that are known to cause cancer and have respiratory, neurological, gastrointestinal, dermatological, and psychological effects. Studies have found that people living near oil and gas wells may be more likely to experience eyes, skin, nose, and throat irritation; asthma; or headaches, dizziness, nausea, and abdominal pain.

Oil and gas operations are known to emit volatile organic compounds, which are chemicals that easily evaporate, and other air pollutants that worsen air quality. Wells that are poorly constructed are more likely to lead to oil and gas leaks. Other oil and gas facilities that are poorly constructed or improperly maintained and monitored can lead to leaks that could contaminate aquifers or increase the risk of explosions. Wells can also release hazardous chemicals even if they are abandoned or left idle, if they are not fully cleaned. Additionally, the process of plugging up or abandoning oil wells can release hazardous materials that may cause several short-term health impacts, headaches, nausea, vomiting, eye and throat irritation, skin rashes, and the exacerbation of pre-existing respiratory conditions, such as asthma.

Other Hazardous Materials

In addition to oil and gas facilities, manufacturing, distributing, and other industrial activities often involve the use of hazardous chemicals. The Department of Toxic Substances Control tracks the evaluation, cleanup, permitting, enforcement, and investigation of potential or current hazardous waste facilities. There are 79 sites within Fullerton that are undergoing corrective action, evaluation, investigation, inspection, or voluntary cleanup. The southwest section of the city, where land uses are primarily industrial, has a concentration of these sites. These sites are being evaluated for the presence of trichloroethylene (TCE) and perchloroethylene (PCE), which are volatile organic compounds that can pose a health risk to people who breathe them or contaminate aquifers used to supply household water.

In addition to these sites, the City is also located on top of a large groundwater aquifer that has experienced contamination from volatile organic compounds, historically used by manufacturing industries in the 1950s, 60s and 70s. To remediate this issue, the Orange County Water District has initiated the North Basin Groundwater Remedial Investigation and Feasibility Study, which aims to monitor and treat the contaminant plume that threatens a number of production wells for the Cities of Fullerton, Anaheim, and Placentia. With oversight from Federal, and State agencies, OCWD has been working to install the necessary monitoring and extraction wells to ensure that the plume does not contaminate the aquifer further and reduce the vulnerability of production wells from being impacted by these compounds.

These chemicals could have harmful effects on people, depending on how much and how long a person is exposed to them (ATSDR 2018). In particular, PCEs and TCEs could evaporate into the air and be inhaled

by persons occupying buildings located on the site (ATSDR n.d.). Children, adolescents, and pregnant women are especially at risk of the health effects associated with these chemicals, which include immune system diseases or pregnancy or birth issues in pregnant women (ATSDR n.d.). Other chemicals that are being evaluated on these industrial sites include benzene, chloroform, and toluene, which are associated with food and beverage manufacturing.

Location and Extent

Oil and Gas Operations

Studies have shown that oil and gas operations can have a negative effect on air quality within roughly 600 feet and cause odors that are noticeable within 1,500 feet. Most scientists, public health professionals, and medical professionals agree that sensitive land use, such as housing, schools, faith institutions, hospitals, and water wells, should be at least a quarter mile from an oil or gas well. However, fires, explosions, and other major emergencies can have an impact at a larger distance (Butler et al.).

Oil fields are located in the northern section of the city, and most of them are plugged or abandoned. Active oil wells operated by the Breitburn Operating LP are located in the East Coyote Hills.

Natural gas is an odorless, flammable gas that is used as a major energy source. Natural gas is distributed through pipelines. There is one Southern California Gas Company natural gas pipeline that runs east-west through the middle of the city. The two primary hazards that natural gas poses are combustion and asphyxiation (Safer America 2017). The gas line shown on **Figure 3-7** is spatially accurate to +/- 500 feet (USDOT n.d.). A pipeline that bursts or leaks releases flammable gas that could ignite a destructive explosion. The risk of pipeline failure is related to pipeline condition, seismic activity, proximity to power lines, and surrounding population density, which amplifies the magnitude of threat.

Other Hazardous Materials

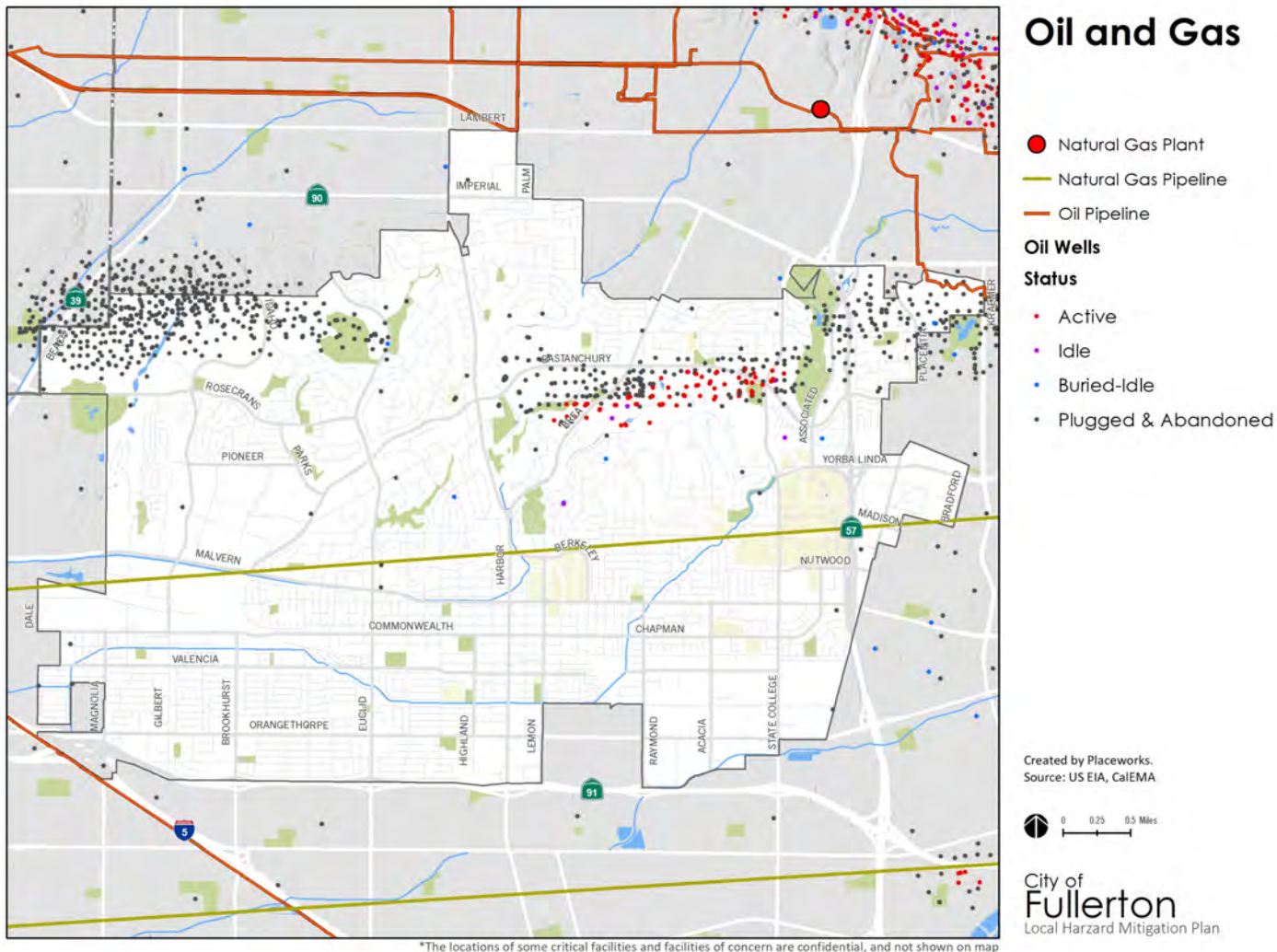
In Fullerton, there are a number of sites designated by the California Department of Toxic Substances Control as sites containing hazardous materials. These are located throughout the city, and typically include underground storage tanks containing petrochemicals, sites where contaminants have been spilled or improperly disposed of, and sites that are permitted to store and use hazardous materials in manufacturing processes. Sewer lines also bisect the city in numerous locations. A break in any of these sewer lines could unleash sewage into the main water supply for the city. Hazardous materials are also transported on highways and railways, many of which pass through Fullerton.

In severe situations, Fullerton may also be at risk of hazardous materials release events on a regional level. Fullerton is in the South Coast Air Basin (SCAQMD 1999). With the right prevailing wind conditions, airborne toxic material could spread to and impact various parts of the air basin, including sections or all of Fullerton.

Figure 3-8 shows areas that are potential sites for hazardous materials release events.

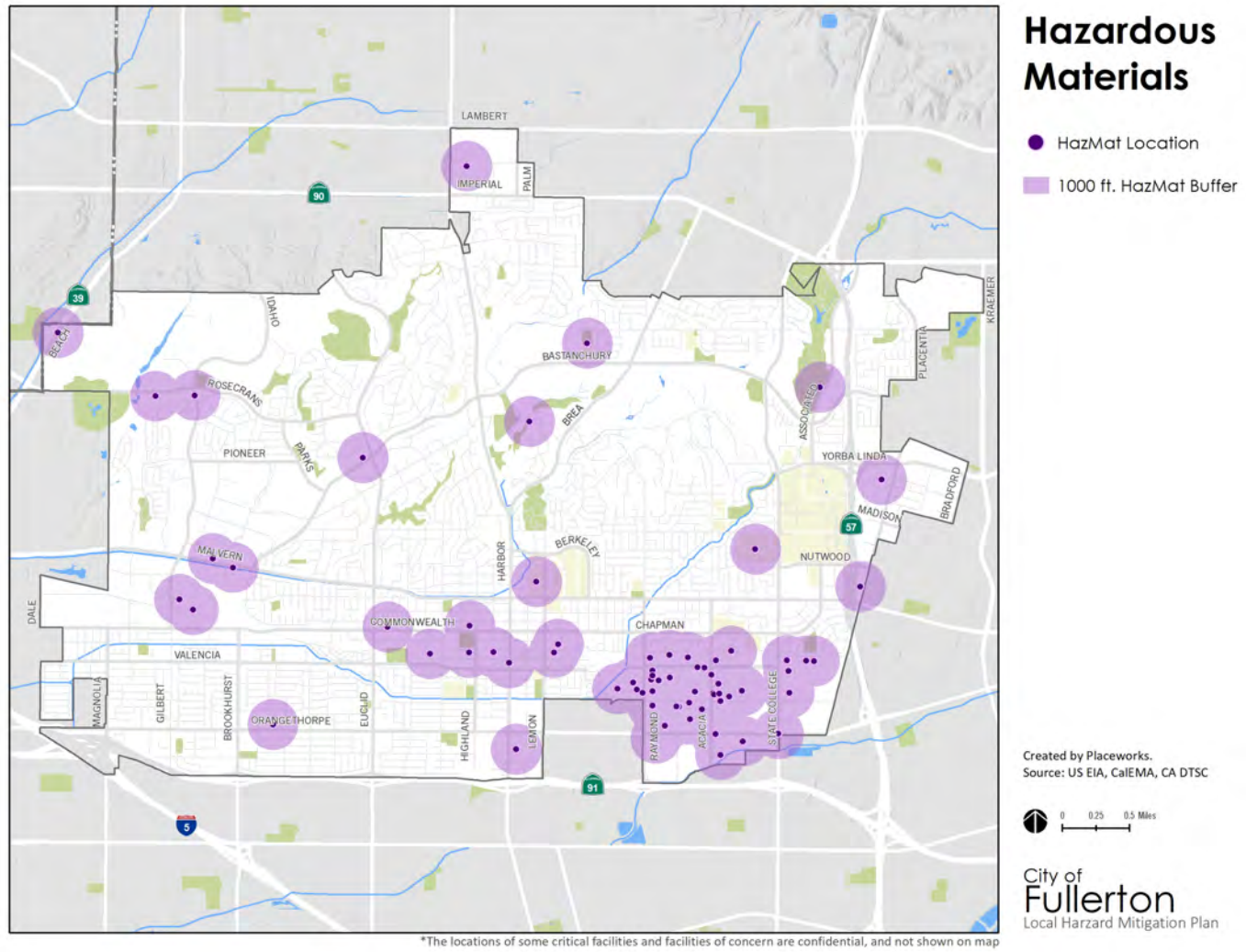
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Figure 3-7: Oil and Gas Operations



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Figure 3-8: DTSC Hazardous Materials Sites



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Past Events

Fullerton has experienced some hazardous materials release events (Cal EMA 2018):

- In January 2006, 75 gallons of diesel was released when a freight truck collided with a fire hydrant at the intersection of Orangethorpe and Acacia and ruptured the containment chamber on the rig. The diesel then infiltrated a nearby flood control channel.
- In March 2010, a corrosive liquid was released when a forklift breached its containment at the 600 block of S. Acacia St.
- In April 2010, 400 gallons of sewage were released via a manhole; 100 gallons infiltrated a storm drain leading to Break Creek Channel.
- In December 2011, 20 pounds of ammonia were released at the 700 block of S. Raymond when a release valve failed to close completely.
- In January 2015, 195 gallons of sewage leaked from a manhole cover in the 1200 block of North Hollydale. The sewage then contaminated the Fullerton Creek Channel.
- In April 2018, 100 gallons of diesel were leaked onto the southbound lanes of SR-57 near S. Bastanchury when a freight truck collided with the center divider.

Risk of Future Events

Given Fullerton's history with hazardous materials release and the presence of hazardous materials sites throughout the city, it is very likely that Fullerton will continue experiencing such events in the future. The high volumes of traffic that passes daily through Fullerton or on adjacent highways, freeways and railways creates a possibility that Fullerton could experience a vehicular or railroad transportation-related hazardous materials release event.

Climate Change Considerations

Climate-related natural hazard events, such as an intense flood, could cause transportation crashes or damage storage containers that result in a hazardous materials release. Climate-related hazards could also exacerbate the effects and impacts of such events. For example, more intense rains could lead to more runoff from a site that is contaminated with hazardous materials.

HUMAN-CAUSED HAZARDS

For the purposes of this plan, numerous hazard profiles have been grouped under human-caused hazards. These hazards are: aircraft incident, civil disturbance, cyber threat, terrorism, and transportation incident.

Description

Aircraft Incidents: An aircraft incident refers to when an aircraft has lost control and crashes either into the ground or with another aircraft. This can be the result of human error, malfunctioning navigation equipment, or environmental conditions that prevent safe operation of the aircraft.

Civil Disturbance: A civil disturbance is an event when the normal operations of the city are either threatened or temporarily interrupted by events such as violent protests, riots, shootings, and armed standoffs. Civil disturbances can occur at a single time or be a string of related events. Property damage of businesses, government facilities, or homes can occur during these events. In extreme situations, death and injury may result from civil disturbances.

Cyber Threats: Cyber threats are when an individual or a group threatens or attempts to disrupt the operations and functioning of the computer systems belonging to private citizens, religious groups, educational institutions, government agencies, or businesses. These threats take the form of online harassment, hacking, or in-person tampering with electronic equipment. Successful cyber threats can lead to service disruptions, infrastructure damage, theft, and in severe instances may cause injury or death.

Terrorism: Terrorism is the use or threat of force to achieve a particular social or political outcome. The goals of terrorism may sometimes be the overturning of a government, the reversal of a public policy, the release of political prisoners, and other such motives. Acts of terror may overlap with acts of war or hate crimes. Increasingly, terrorists strike at the cyber infrastructure that helps keep communities and local governments running, an act known as cyber-terrorism.

Terrorists use a variety of methods to achieve their goals. Generally, they try to kill or seriously harm people, or they may attempt to disrupt civil society by destroying property or infrastructure, attacking government operations at all levels, interrupting essential public services, creating chaos, or a combination of some or all of these goals. Firearms and explosives are the most common weapons among terrorists, although other means may be used in lieu or in combination with these. In extreme situations, terrorists may gain access to weapons of mass destruction, which typically include such deadly agents as: bioweapons, chemical agents, radioactive materials, or high-yield explosives. It should be noted that these events are very rare. While incidents of terror caused by foreign individuals or groups receive significant media and public attention, most acts of terror in the United States have been caused by domestic terrorists.



Orange County Sheriff's deputies arrive at the campus of California State University, Fullerton in case of violent demonstrations. Image from [Orange County Register](#).

Transportation Incidents: A transportation accident is a crash or other failure involving a vehicle, including a car, truck, or train. This can be the result of the vehicle operator making an error or environmental conditions that prevent the vehicle from being safely maneuvered. Examples of transportation accidents include automobile crashes, freight truck collisions, and train crashes or derailments. Aviation transportation accidents are discussed separately in this section. It should be noted that small-scale incidents, such as a minor collision between automobiles, would not count as a hazard. A large-scale collision, however, that involves multiple vehicles and shuts down a freeway could present a hazard to

Fullerton because it could deter first responders from reaching victims or prevent residents from evacuating quickly.

Location and Extent

Aircraft Incidents: The Fullerton Municipal Airport is in the southwestern portion of the city, close to the border with Buena Park. The runway for the airport is on an east-west axis, with aircraft approaching from both ends. It is therefore possible that an aircraft incident could occur along any of these approach pathways. Aircraft incidents could also occur at the airport facility itself. Since the year 2000, there have been 22 accidents at FMA as documented by the National Transportation Safety Board (NTSB) database. From 1984 through September 2004, twenty aircraft accidents occurred within two miles of the airport in the cities of Fullerton and Buena Park (ALUC 2004).

Civil Disturbance: Civil disturbances can arise at any time and place for a variety of reasons. There are, however, some places where such events are more likely to emerge, including city hall, state and federal government centers, jails, police stations, major businesses, university campuses, and places of public assembly.

No definitive scale for measuring civil disturbance events exists, but a number of metrics may be used individually to determine a civil disturbance event's impact. These measures include:

- Number of facilities affected
- Number of fatalities
- Monetary loss
- Interruptions to communications infrastructure
- Number of people protesting
- Impacts to certain socioeconomic groups (Renn et al. 2011, Cal OES 2018)

Cyber Threats: Since computers are so ubiquitous, a cyber threat could appear in virtually any part of the city. In extreme circumstances, a threat could impact the entire city. Cyber threats vary in their length and severity in impact. A minor threat could simply cause computer systems to slow down for a few minutes and not behave as responsively. On the other hand, a major cyber threat could cause a complete shutdown of critical systems, including those used by banks, healthcare institutions, universities, major businesses, and city government.

Cyber threats are not measured in any particular scale, but they can be assessed by determining:

- The type of incident (website defacement, denial of service, unauthorized surveillance).
- The use of malicious software.
- The level of security countermeasures that failed in preventing the cyber threat.
- The duration of the cyber threat (a few hours, a few days, several weeks, etc.). (Mateski et al. 2012)

Terrorism: Terrorism can occur anywhere, although public spaces are more common. This includes such places as shopping malls, religious buildings and institutions, schools and universities, hospitals and medical clinics, government centers and complexes, and public gatherings or events. Terrorists may also choose infrastructure such as electric-generating facilities, water treatment plants, dams or reservoirs, railroads, highways, and other such areas. In some cases, private homes or businesses may be targeted. Terrorist acts are typically measured by the fatalities, injuries, and destruction they cause but there is no universally used scale for measuring terrorist events.

Transportation Incidents: Arterial streets, highways, freeways and railways are widespread in and around Fullerton. Major freeways passing through Fullerton include SR-57 (the Orange Freeway) and SR-91 (the Riverside Freeway). Rail infrastructure bisects the northern half of the city from the south. Passenger and freight rail use this right-of-way, including Metrolink, Amtrak, Burlington Northern Santa Fe (BNSF) and Union Pacific (UPRR). Any of these transportation corridors, or others in or around Fullerton, could be the site of a transportation incident that affects the community. Generally, transportation incidents are measured by the number of deaths they cause.

Past Events

Aircraft Incidents: Fullerton and the surrounding area have a history of aircraft accidents, including:

- In 1986, a passenger jetliner collided with a small propeller plane above the nearby city of Cerritos across the county line. The smaller plane was destroyed in the air, and the jetliner crashed into a residential neighborhood below, killing 15 residents of Cerritos and destroying 16 homes. (Harrison 2016)
- In September 2004, a pilot lost control of their plane during an airshow at the Fullerton Municipal Airport. The plane immediately crashed following take-off, injuring the pilot. (Aviation Safety Network 2004)
- In August 2016, the pilot of a small propeller plane lost control of the aircraft, sending the plane crashing into the wall of a hangar at the Fullerton Municipal Airport. The pilot and co-pilot suffered minor injuries. (Branson-Potts 2016)

Civil Disturbance: While Fullerton does not have an extensive history of civil disturbance, some notable events are listed below. Many have taken place at the CSUF campus:

- In spring semester in 1970, numerous protests erupted at the campus of CSUF in response to the Vietnam War, a campus visit by then-governor Ronald Reagan, and the massacre at Kent State University in Ohio. Governor Reagan ordered the university to shut down prior to final exams week. In total, more than 60 students and faculty members were arrested across the semester. (Fox 2009)

- Between July 2011 and January 2014, a series of protests took place in response to death of a Fullerton-based homeless man at the hands of the Fullerton Police Department. At the announcement of the acquittal of the officers involved in the death, violent protests erupted that resulted in the arrest of 13 people. A protester attacked a TV news camera woman, and a Fullerton Police station was defaced with graffiti. (Clay 2014; Winton and Sewell 2011; CBS Los Angeles 2014a)
- In October 2017, scuffles erupted between two sides of a protest at the campus of CSUF when a white supremacist was invited to speak by a campus student group. Objects were thrown from one group at the other, and one woman was reported to have been releasing a can of pepper spray into the air. Officers from the Orange County Sheriff's Department and CSUF University Police were present and arrested eight of the demonstrators. (Kopetman 2017)

Cyber Threats: Generally, Fullerton does not have a history of cyber threats. The only event of note occurred following an officer-related beating that resulted in the death of local homeless man, Kelly Thomas. In response, a hacking group called Anonymous threatened to hack the website of the Fullerton Police Department. City staff responded by shoring up security. No actual hacking materialized out of the threat (Winton and Grad 2011).

Terrorism: While there are no recorded terrorist events within Fullerton itself, terrorist activity has recently occurred in the area:

- A teenager was arrested in 2014 who was reported as having threatened terrorist action against event attendees of the US Open of Surfing. (Connelly and Emery 2014)
- In May 2015, two Anaheim-based men were arrested at a Transportation Security Administration checkpoint at the Los Angeles International Airport who had reportedly sworn allegiance to the Islamic State of Iraq and Syria (ISIS). One of these men, Muhanad Badawi, was a student at Fullerton College. (Winton 2016)
- In December 2015, a mass shooting and terrorist attack committed by a married couple who had reportedly sworn allegiance to ISIS killed 14 people at a medical facility in San Bernardino. (Global Terrorism Database 2018)

Transportation Incidents: Fullerton has experienced frequent transportation accidents, including:

- In November 1999, a Metrolink train collided with a freight train in near Brookhurst Road in Fullerton. While nobody was killed, 19 people were injured. The collision caused the railroad through Orange County to be temporarily closed and more than 3,500 Metrolink commuters were affected and had to seek alternative routing. (Winslow 2018; Harris et al. 1999; CBS Los Angeles 2018; Cal EMA 2018)
- In February 2018, a passing Amtrak train struck a person who had trespassed onto the right-of-way near the Fullerton Train depot. The train was not derailed and the trespasser survived with injuries.
- In March 2018, a man was hit by a passing Metrolink train in an apparent suicide.

- In April 2018, a freight truck struck the center median of SR-57 near Bastanchury Road in Fullerton and overturned, shutting down the highway for nearly 12 hours.
- In July 2018, a passing freight train fatally struck a person who had trespassed onto the right-of-way near the Fullerton Train Depot.

Risk of Future Events

Aircraft Incidents: While it is possible to reduce the risk of aircraft incidents as much as possible, given that aircraft operations are subject to human error, there is always potential for an accident. As long as the Fullerton Municipal Airport continues operations, an aircraft incident could occur, given the history of such events in the area. The Fullerton Municipal Airport is, however, subject to the Airport Environs Land Use Plan (AELUP) adopted by the Airport Land Use Commission (ALUC) pursuant to the Public Utilities Code. In the AELUP, the ALUC, has placed land use restrictions on new uses in a safety zones around the runway based on the accident data and operations of the airport to reduce the potential for loss of life and property. Even without the impact caused by the City's airport, the high volume of air traffic in the area operating out of other regional airports contributes to the risk of an aircraft accident in Fullerton.

Civil Disturbance: While civil disturbance events may be rare, there is still a possibility that they could occur in the future in Fullerton. Given that a number of civil disturbance events have occurred at the campus of CSUF in the past, it is safe to say that more such events will emerge in the future. Other future civil disturbance events may take place in Downtown Fullerton or other areas where large groups of people tend to congregate.

Cyber Threats: Due to the integrated nature of technology into the everyday lives of Fullerton's residents, businesses, and government operations, it is possible that a cyber threat could emerge in the future. Given that no cyber threats are publicly known to have disrupted the City of Fullerton's normal operations in the past, the likelihood of a cyber threat severely handicapping the City in the future is unlikely.

Terrorism: Given that terrorist activity has its root causes in a variety of factors—such as global geopolitics, warfare, economics, and religion, etc.—it is impossible to predict whether or not a terrorist attack will occur. Since Fullerton does not feature facilities of critical national or state importance, however, it is less likely (although possible) that Fullerton will attract the attention of international terrorist groups. Acts of terror committed in Fullerton are more likely to be conducted by smaller organizations or individuals, although the effects may be no less significant.

Transportation Incidents: It is a certainty that transportation accidents will continue. While it is possible to guard against such events and implement safety measures, it is impossible to prevent every single transportation accident. Fullerton has a history of people trespassing on railroad tracks, and it is likely that people will continue to do this, endangering themselves and others. The large volume of traffic on streets and highways in and around Fullerton also makes it likely that an accident will occur on either of these pieces of transportation infrastructure in the future.

Climate Change Considerations

Aircraft Incidents: The link between aircraft accidents and climate change is not well understood at this time. Although climate change is not likely to directly increase or decrease the number of aircraft incidents, it is feasible that more instances of severe weather could heighten the risk of an aircraft incident.

Civil Disturbance: It is not expected that climate change will have a direct impact on civil disturbance in Fullerton. It has been suggested, however, that increases in temperature may increase the likelihood of people to take to the streets and gather in crowds, potentially setting the stage for a riot (Khaleeli 2016). An increase in hot weather in Fullerton could, therefore, potentially increase the risk of civil disturbance. Hardships created by climate change, such as economic disruptions, could also indirectly increase the risk of civil disturbance.

Cyber Threats: Climate change will most likely not influence cyber threats in Fullerton.

Terrorism: The link between terrorism and climate change is not well understood. It has been suggested, however, that the impacts of a changing climate may exacerbate existing social, political, religious, and ethnic tensions. For example, longer, more intense droughts may restrict food supply or place limits on economic growth for cities, regions, or even whole countries. Nevertheless, the likelihood of climate change impacting terrorist activity in Fullerton is negligible, since these changes are more likely to impact developments on the national or international level.

Transportation Incidents: Climate change is not likely to impact transportation accidents in Fullerton.

SEISMIC HAZARDS

A seismic hazard is the consequence of earthquakes and other tectonic activity. This Plan includes fault ruptures, liquefaction, and seismic shaking as seismic hazards. Landslides, which may be caused by earthquakes, are discussed in the Geologic Hazards section.

Description

Fault Rupture: The shifting and movement of the Earth’s tectonic plates are responsible for seismic events. These tectonic plates can pull away from, move toward, or pass by each other. As they do, the plates sometimes lock together. This creates tension, and eventually the built-up tension is released like a springboard. The tension dissipates into the Earth’s crust.

The location at which two tectonic plates join is called a fault line. Fault lines are sometimes visible on the Earth’s crust as sudden rifts or anomalies in the continuity of the landscape. In California, the major north-south fault line is the San Andreas Fault—where the North American and Pacific Plates meet. Constant friction between the two plates over the millennia, however, has caused the areas where the two plates intersect to become fragmented, creating new, smaller faults.

The area in the immediate vicinity of a fault line is at risk of damage due to the potential for a fault rupture—the deformation or displacement of land on either side of the fault, which may move a few inches to several feet in opposite directions. Any buildings or infrastructure situated around, on top of, or

across a fault line could potentially be severely damaged or destroyed. The direction of the fault rupture depends upon the fault type: dip-slip faults produce vertical shearing, strike-slip faults produce horizontal shearing, and oblique-slip faults produce both vertical and horizontal shearing. A fourth kind of fault, called a “blind” fault, produces virtually no visible displacement of land.

Some faults have emerged fairly recently in geologic history. Quaternary faults are faults that have developed any time between the Holocene Era and the present (within the last 1.8 million years). These faults are especially concerning since they are the most likely to be active and cause future earthquakes.

The Alquist-Priolo Earthquake Fault Zoning Act enables the California State Geologist to designate zones surrounding active faults as Alquist-Priolo Special Study Zones, which is a special regulatory zone that requires additional study, to determine the location of the fault and the limits of the area prohibited from surface construction on top of the known location of an active fault.

Liquefaction: Liquefaction is a kind of seismic event that occurs in response to the sudden shaking of loose, water-saturated soil. When this happens, the ground no longer seems solid but rather like a liquid. Any structures built on top of a zone of liquefaction during a seismic event are at risk of serious damage. Infrastructure, such as pipelines, utility poles, water tanks, and other kinds of critical facilities are also at risk of being affected or destroyed by liquefaction events.

Seismic shaking: Seismic shaking refers to when the ground shakes as a result of an earthquake or other seismic event. Seismic shaking may cause billions of dollars’ worth of property damage across a whole region, but it may also be virtually undetectable to all except seismic measuring tools. Seismic shaking’s severity is determined by how much energy is released, how long the rupture is, and the depth of the origin. Areas that are closest to the epicenter of the seismic event generally experience the most shaking.

The susceptibility of a structure to damage from ground shaking is related to the underlying bedrock or soil as well as the strength of the earthquake itself. Material that is firm and solid can intensify short-period motions, causing stronger shaking, because seismic waves travel faster through harder material than softer material.

KEY TERMS

Spectral Acceleration: The maximum acceleration experienced by a building or other structure during an earthquake.

Period: The time it takes to complete one cycle of a seismic wave, measured in seconds or fractions of a second.

Location and Extent

Fault Rupture: There are several smaller fault lines that pass through or lie underneath Fullerton. The Puente Hills Blind Thrust System runs north-south through Fullerton. Sections of the Elysian Park and Yorba Linda fault lines pass through Fullerton’s southwestern and southeastern areas respectively. The Coyote Hills faults, a series of smaller, shorter faults, run through northern sections of Fullerton. One of these fault segments, located just north of the City, is located within an Alquist-Priolo Special Study zone. (Dept. of Conservation 2010; USGS 2018b).

In addition to these local faults, there are six major regional faults that could potentially impact Fullerton:

- The closest point of the Whittier-Elsinore Fault is 1.6 miles northeast of Fullerton.
- The closest point of the Newport-Inglewood Fault is 9.8 miles southwest of the city.
- The closest point of the Sierra Madre/San Fernando Fault is approximately 14 miles north of Fullerton.
- The Palos Verdes Hills Fault is 20 miles southwest of the city at its closest point.
- The San Jacinto Fault is 36 miles east of the city.
- The San Andreas fault, the dominant fault system in Southern California, is 37 miles northeast of Fullerton at its closest point.

Figure 3-9 shows local and regional fault lines, their location relative to Fullerton, and their shake potential.

While significant efforts have been undertaken to identify and map fault lines in Southern California, there are still some fault lines or segments of fault lines that are either unmapped or completely unknown. It is possible for a fault rupture to occur along any of these unidentified faults.

Fault rupture events are usually measured using the distance of displacement of one side of the fault to the other. The longer the length of the fault rupture, the greater the impact of the event.

Liquefaction: Liquefaction can occur in areas with a high level of groundwater. Generally, areas with a higher water table are at more risk of liquefaction than areas with a lower water table.

Areas of liquefaction potential are delineated on the map in **Figure 3-10**. Local geology and groundwater conditions, as well as historical events, all influence which areas are susceptible to liquefaction. The Coyote Creek Floodplain in the northwest section of Fullerton contains an abundance of saturated, loose sandy soils at depths less than 40 feet. These sediment layers have the potential to liquefy in the event of an earthquake, causing this area to have a high liquefaction susceptibility. Although the Carbon Creek alluvial fan is composed of loose, sandy material, there is a low susceptibility because groundwater is relatively far below the surface. Since liquefaction occurs in areas with highly water saturated soil, areas of liquefaction with slopes are

KEY TERMS

Deep-Seated Landslide: A landslide event generated by a gradual accumulation of water under the surface of the ground that weakens slope faces. They often lead to property damage.

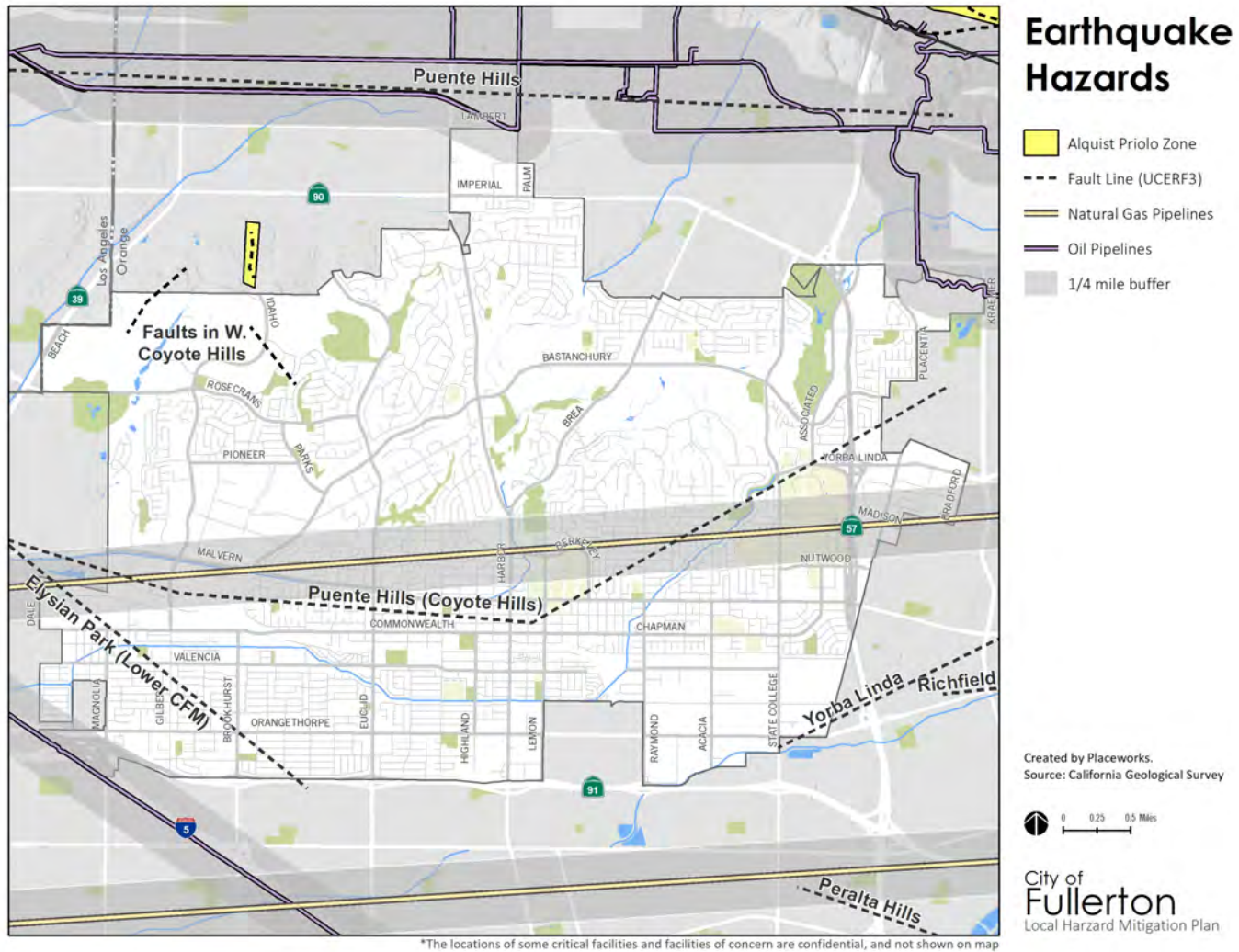
Alluvial Fan: Geologic formation in the shape of a fan that is formed when sediments from mountain rivers are deposited on flatter terrain.

also known to trigger events known as “deep-seated landslides” which are landslides that occur when water accumulates in the soil underneath the slope’s surface. The areas of West Coyote Hills and East Coyote Hills have a susceptibility to deep-seated landslide.

While liquefaction events are not measured on any standardized scale, multiple factors may be used to assess the size of the event, such as:

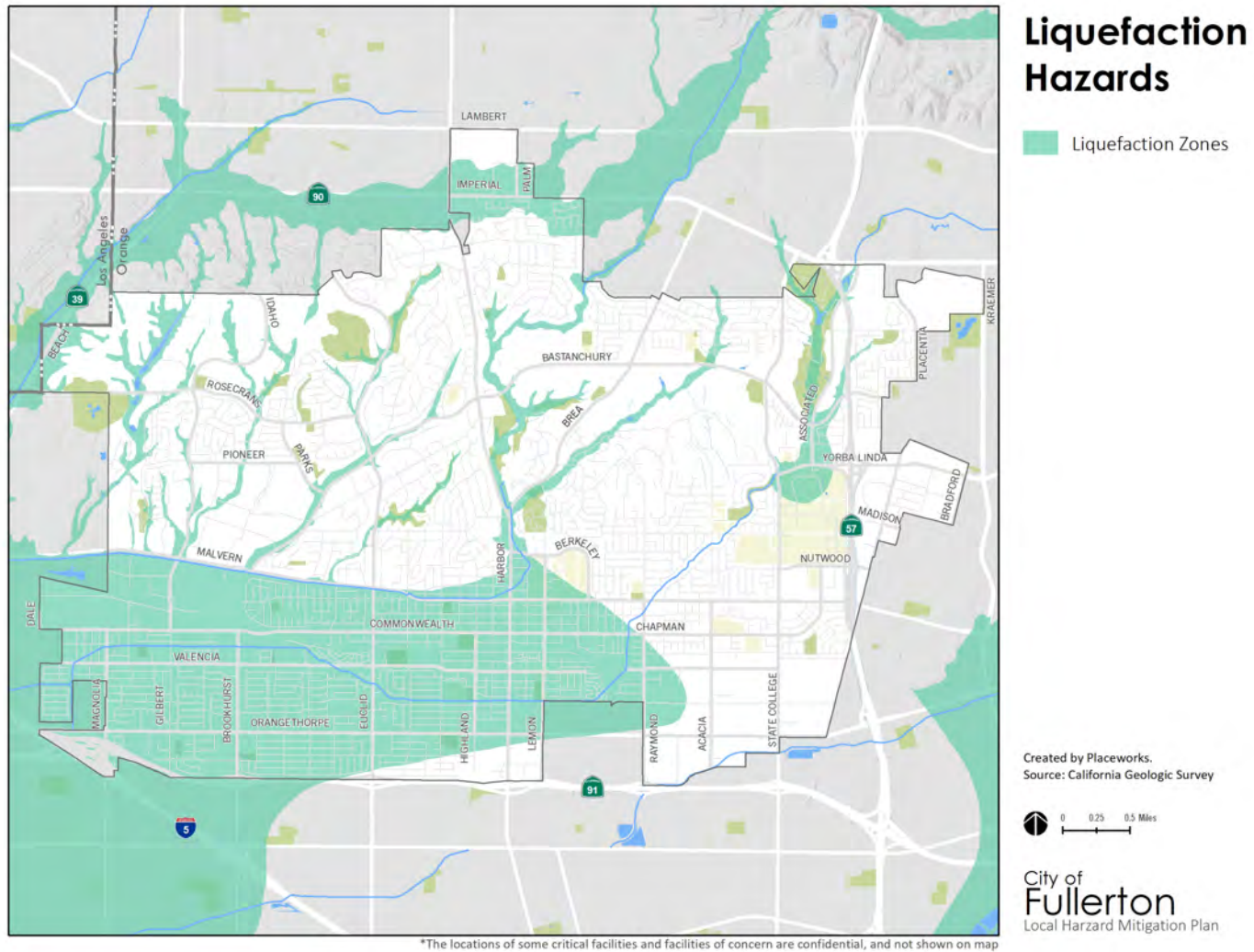
- Type of ground material
- Amount of material
- Strength of shaking
- Size of the affected area

Figure 3-9: Local and Regional Fault Lines Map



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Figure 3-10: Liquefaction Hazards Map



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Seismic shaking: Generally, seismic shaking events are measured using the Modified Mercalli Intensity (MMI) scale, which uses visible damage as a benchmark for each event. A seismic event will have a different MMI measurement in different locations, depending on the amount of damage done. The MMI scale uses Roman numerals ranging from I (1) to XII (12). **Table 3-9** shows the MMI scale.

TABLE 3-9: MODIFIED MERCALLI INTENSITY SCALE

Intensity	Description	Description
I	Instrumental	Felt only by a very few people, under especially favorable conditions.
II	Feeble	Felt only by a few people at rest, especially on the upper floors of buildings.
III	Slight	Noticeable by people indoors, especially on upper floors, but not always recognized as an earthquake.
IV	Moderate	Felt by many indoors, and by some outdoors. Sleeping people may be awakened. Dishes, windows, and doors are disturbed.
V	Slightly strong	Felt by nearly everyone, and many sleeping people are awakened. Some dishes and windows broken, and unstable objects overturned.
VI	Strong	Felt by everyone. Some heavy furniture is moved, and there is slight damage.
VII	Very strong	Negligible damage in well-built buildings, slight to moderate damage in ordinary buildings, and considerable damage in poorly-built buildings.
VIII	Destructive	Slight damage in well-built buildings, considerable damage and partial collapse in ordinary buildings, and great damage in poorly-built buildings.
IX	Ruinous	Considerable damage in specially designed structures. Great damage and partial collapse in substantial buildings, and buildings are shifted off foundations.
X	Disastrous	Most foundations and buildings with masonry or frames are destroyed, along with some well-built wood structures. Rail lines are bent.
XI	Very disastrous	Most or all masonry structures are destroyed, along with bridges. Rail lines are greatly bent.
XII	Catastrophic	Damage is total. The lines of sight are distorted, and objects are thrown into the air.

Source: USGS 2018c.

Seismic events are also measured using the moment magnitude scale (MMS, denoted as M_w or simply M) which is a measurement of the energy released at the fault rupture. It has replaced the Richter scale, which is less reliable for large earthquakes. The MMS begins at 1.0 and increases as the energy of the earthquake increases. The MMS is a logarithmic scale, meaning that the difference between numbers on the scale multiplies as they increase. For example, an earthquake with 5.0 M_w is approximately 1.4 times greater than 4.9 M_w , 32 times greater than 4.0 M_w , and 1,000 times greater than 3.0 M_w .

Fullerton is in a High Seismic Zone, as defined by the Fullerton Building Code, which incorporates the 2016 edition of the California Building Code. There is a high risk of ground-shaking throughout Fullerton. The magnitude or intensity of the shaking will depend on the magnitude of the earthquake and the distance from the epicenter. The Puente Hills Fault has the greatest potential to cause intense ground shaking for this reason.

Past Events

Fault Rupture: The largest recent fault rupture near Fullerton was the 1994 Northridge earthquake, a 6.7 M_w event approximately 42 miles from downtown Fullerton, and the most destructive earthquake in the United States in nearly 100 years. The resulting destruction included property damage to more than 4,000

buildings as well as the destruction of numerous freeway structures across the Los Angeles region (RMS 2004).

More recently, a 5.1 M_w earthquake beneath La Habra in 2014 caused fault rupturing adjacent to but not directly on the Puente Hills and Whittier faults (Graves et al. n.d.). As a result, six gas and water transmission lines were broken in Fullerton (CBS Los Angeles 2014b).

Liquefaction: There is no record of historic or paleo-seismic liquefaction in the area in and around Fullerton. All potential zones for liquefaction are based on soil susceptibility rather than past events (Dept. of Conservation 1997).

Seismic shaking: Significant seismic shaking events that were felt in Fullerton include the 1994 Northridge earthquake and the 1987 Whittier Narrows earthquake. Both of these quakes caused minor damage to properties, disrupted some city infrastructure, and broke utility lines, though neither caused any significant damage in Fullerton. The most recent significant seismic shaking event that impacted Fullerton was a 2014 5.1-magnitude quake that struck Fullerton as well as the surrounding communities of Brea and La Habra, causing up to \$824,000 of damage across the three cities (Palta 2014). The shaking broke water mains and disrupted electrical transmission to nearly 3,000 Southern California Edison customers across northern Orange County (Schwenke and Lin II 2014). Other

Table 3-10 shows major earthquakes (at least 6.0 M_w) within 100 miles of downtown Fullerton.

TABLE 3-10: SIGNIFICANT EARTHQUAKES WITHIN 100 MILES OF FULLERTON

Event Name	Distance (Miles)*	Magnitude
1933 Long Beach Earthquake	18	6.4
1948 Desert Hot Springs Earthquake	92	6.0
1952 Kern County Earthquake	97	7.5
1971 San Fernando Earthquake	15	6.6
1986 North Palm Springs Earthquake	77	6.0
1992 Landers Earthquake	89	7.3
1994 Northridge Earthquake	41	6.7

Source: SCEDC 2011.

* Distance between epicenter and downtown Fullerton

Risk of Future Events

Fault Rupture: Given the history of fault rupture in and around Fullerton, it is very likely that fault rupturing will occur again in Fullerton's future. Furthermore, it is suggested that human activity, including the pumping of wastewater into the ground, oil extraction, oil well water injections, and others could lead to seismic and geologic hazards, including additional underground faulting (Graves et al. n.d.). Since oil production and agriculture have caused both petroleum and water to be withdrawn from the ground beneath Fullerton, there is a chance that Fullerton could be at higher risk for faulting than other communities in the vicinity that do not have a history of withdrawing subterranean resources.

Liquefaction: As long as the conditions for liquefaction events exist, such an event is feasible. Given Fullerton's known lack of historical liquefaction events, despite the presence of liquefaction-prone soil, there is a low likelihood that Fullerton will experience a liquefaction event in the foreseeable future.

Seismic shaking: Since Fullerton is situated in a seismically active area and has experienced seismic shaking in the past, it is nearly inevitable that seismic shaking will occur again in Fullerton’s future. The Third Uniform California Earthquake Rupture Forecast (UCERF3) was released in 2015 and provides the likelihood of a major earthquake on various faults between 2015 and 2044. **Table 3-11** shows the probabilities of a significant earthquake by magnitude on the key fault lines near Fullerton, as estimated by the UCERF3 forecast.

TABLE 3-11: EARTHQUAKE PROBABILITIES FOR KEY FAULTS NEAR FULLERTON (2015-2044)

Fault	Distance (Miles)*	Probability			
		6.7+ M _w	7.0+ M _w	7.5+ M _w	8.0+ M _w
Yorba Linda	3	0.09%	0.08%	0.03%	Negligible
Puente Hills	4	0.59%	0.52%	0.19%	Negligible
San Joaquin Hills	11	0.40%	0.38%	0.24%	Negligible
Whittier	12	1.45%	1.26%	0.66%	Negligible
Newport-Inglewood	12	0.95%	0.81%	0.42%	Negligible
Palos Verdes	21	3.09%	2.79%	0.10%	Negligible
Sierra Madre	21	1.10%	1.06%	0.72%	0.03%
San Jacinto	38	4.24%	4.22%	4.18%	2.31%
San Andreas†	38	20.79%	18.32%	15.71%	6.70%

Source: USGS 2015.

Note: UCERF3 results consist of two individual models (3.1 and 3.2), each of which provides rupture probabilities for each segment of the fault. This table shows the maximum probability for a section of the fault in either model.

* Distance between downtown Fullerton and the nearest point of the fault. All distances are approximate.

† Southern California segments only.

In addition to the UCERF3 forecasts, which project the odds of a major earthquake on local and regional faults, the US Geological Survey forecasts the severity of seismic shaking in different locations for various plausible earthquake scenarios. **Table 3-12** shows the anticipated shaking in Fullerton from some of these scenarios.

TABLE 3-12: SELECTED SHAKING SCENARIOS FOR FULLERTON

Fault	Magnitude (M_w)	Distance to Epicenter (Miles)*	MMI in Fullerton
Peralta Hills	6.6	7	VIII (Destructive)
Whittier	6.9	8	VIII (Destructive)
Anaheim	6.4	4	VIII (Destructive)
Chino	6.6	12	VIII (Destructive)
	6.8	13	VIII (Destructive)
Newport-Inglewood	7.0	2	VIII (Destructive)
	7.2	14	VII (Very strong)
	7.5	75	VIII (Destructive)
Palos Verdes	7.3	19	VIII (Destructive)
	7.7	50	VIII (Destructive)
Elsinore	7.0	25	VIII (Destructive)
	7.3	23	VIII (Destructive)
	7.7	110	VIII (Destructive)
Sierra Madre	7.3	25	VIII (Destructive)
San Jacinto	7.3	42	VIII (Destructive)
San Andreas	7.2	46	VIII (Destructive)

Source: USGS 2018d.

* Distance between downtown Fullerton and the epicenter (the point on the surface above where the fault rupture began).

Climate Change Considerations

Fault Rupture: Generally, there is no known direct connection between fault rupturing and climate change. Some evidence suggests that greater oceanic pressure on tectonic plates as a result of melting land ice could influence the behavior of seismic events, but there is little to indicate that this would play a major factor in any seismic event, including fault rupturing.

Liquefaction: Changes in precipitation patterns could affect groundwater levels, which could in turn affect the susceptibility of soils in Fullerton to liquefaction. At this time, however, there is no evidence to suggest that climate change affects liquefaction events in a substantial way.

Seismic shaking: Generally, there is no known direct connection between seismic shaking and climate change, although there is some evidence that melting land ice may influence seismic shaking at a global scale. This is unlikely to cause noticeable changes in seismic shaking at a local level.

SEVERE WEATHER

For the purposes of this plan, numerous hazard profiles have been grouped under severe weather hazards. These hazards are: extreme heat, heavy rain, severe wind, and tornadoes.

Description

Extreme Heat: An extreme heat event is a day when temperatures reach levels that are significantly higher than normal. In California, extreme heat has been defined as any day when the maximum temperature surpasses 98 percent of all prior historic high temperatures for the area, using the time between April and October from 1961 to 1990 as the baseline. Extreme heat events differ from region to region based on the area's climate. An extreme heat event in the Central Coast area of California will likely have a lower

threshold than an extreme heat event in the Central Valley. A succession of extreme heat events is generally referred to as a heat wave.

Humidity plays a factor in the perceived heat that people feel. Generally, humidity will make a hot day feel even hotter than a dry day even though the temperature may be the same. This difference between actual heat and apparent heat is called the heat index. As an example, a 100°F day with 50 percent humidity will feel like a 118°F day (NOAA 2018b). **Figure 3-11** shows NOAA’s National Weather Service Heat Index.

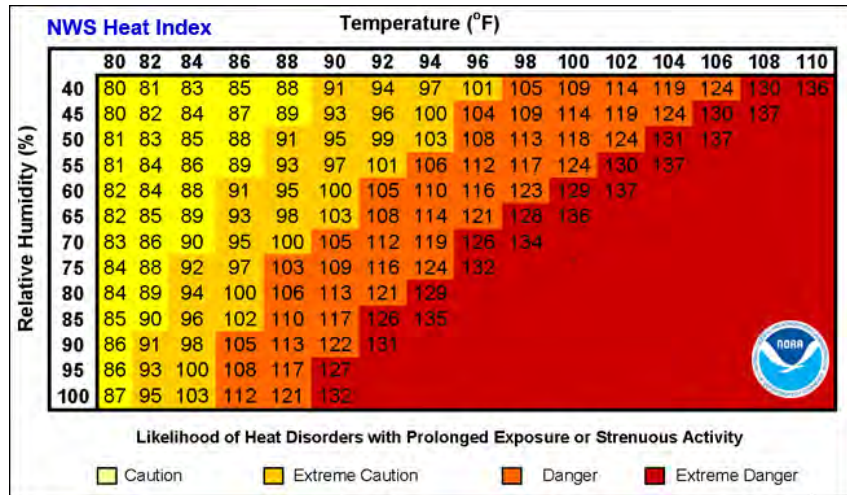


Figure 3-11: NOAA Heat Index

Extreme heat is dangerous for a variety of reasons. The human body cannot withstand long periods of heat and will suffer heat exhaustion and dehydration if precautions are not taken. Severe extreme heat may cause heatstroke, when internal body temperatures surpass 105°F. Without intervention, organ failure and even death can result. The elderly are especially at risk of extreme heat events, as are people who spend time or work predominantly outside, such as agricultural or construction workers.

Heavy Rain: During severe weather events such as strong storms, rain can fall at such a high rate that it cannot drain away fast enough. The resulting heavy rain can cause flooding, leading to inundation and potential damage to buildings, road networks, public areas, utilities, and other critical pieces of infrastructure. In California, heavy rainfall events are often short, intense bursts of rain, but in some cases heavy rain can persist for multiple days.

Severe Wind: Wind is simply the movement of air caused by differences in atmospheric temperature. High pressure air will naturally move to areas of low air pressure. Usually, the distance between these high and low pressure zones is far. On occasion, however, these low and high pressure zones may be near one another. When this happens, air will flow dramatically, creating high-speed winds.

When winds are fast enough, they can cause property damage to homes, public facilities, utilities, and other infrastructure. They can also uproot or topple mature trees or pick up debris and send it careening through the air. This debris can injure or even kill bystanders who may find themselves stranded outside. High speed winds can also deposit this debris in the middle of rights-of-way, such as roads, freeways, and railways, blocking exit routes for would-be evacuees or impeding access to first responders trying to reach wounded people.

Tornado: A tornado is a unique kind of extreme wind event that occurs when a vertical column of wind oscillating at very high speeds makes contact with earth. These kinds of conditions usually occur during electrical storms. Tornadoes can cause severe damage and injure or kill people. While these events are

rare in California, some tornadoes emerge under unique conditions. In especially rare circumstances, the extreme heat generated by wildland fires has been demonstrated to create circling towers of wind which are effectively tornadoes (Holthaus 2018). More common wind events that exhibit similar speeds to those of tornadoes include downbursts, microbursts, and derechos. Like tornadoes, these events are generated by thunderstorm conditions.

Location and Extent

Extreme Heat: Extreme heat events may occur anywhere in Fullerton. The threshold for an extreme heat day in Fullerton is 98.4°F (Cal-Adapt 2018).

Heavy Rain: The location and size of a rain event varies depending on regional geography as well as regional and global weather events. For example, small precipitation events may occur in only one particular section of Fullerton. In contrast, a large rain event could inundate a majority of Orange County as well as other jurisdictions.

As a whole, California’s precipitation varies from year to year depending on how much moisture the state receives from atmospheric rivers. Atmospheric rivers are corridors along which wet air travels from the tropics to continents. When the moisture arrives in California, it may precipitate as rain or snow. One of the most commonly known atmospheric rivers in California is the “Pineapple Express,” which brings moist air from the ocean surrounding Hawai’i to California. During certain years, an immense amount of moisture may be transported along the atmospheric rivers that cross over California, leading to severe rains (NOAA 2015).

Another weather phenomenon influencing rainfall in southern California—“El Niño,” officially referred to as the “Southern Oscillation” or “El Niño-Southern Oscillation (ENSO)” —can cause increased rainfall, particularly during the winter months. ENSO is caused by warming of the surface of the eastern tropical Pacific Ocean, leading to evaporation of warm, moist air into the atmosphere. Winds bring this moisture to the eastern Pacific and the American continents, where it falls as rain. ENSO does not always lead to increased rainfall by default but, in general, it can increase the chances for a winter with higher-than-usual precipitation (NOAA 2014, 2016).



A rainy day at the campus of California State University, Fullerton. Image from Mihaylo College of Business.

Rain events are usually measured by amount of precipitation that falls. **Table 3-13** categorizes rain events by the amount of precipitation per hour.

TABLE 3-13: MEASURING HEAVY RAIN EVENTS

Rain Type	Description
Heavy rain	More than 4 mm per hour but less than 8 mm per hour.
Very heavy rain	Greater than 8 mm per hour.
Moderate shower	Greater than 2 mm, but less than 10 mm per hour.
Heavy shower	Greater than 10 mm per hour, but less than 50 mm per hour.
Violent shower	Greater than 50 mm per hour.

Source: USGS 2016.
mm = millimeter

Severe Wind: In southern California, the most common type of severe wind event is called the Santa Ana winds. High pressure over Nevada and Utah, often during the fall and winter months, forces air down from the high desert toward the ocean. As the winds descend, they heat up and increase in speed, sometimes carrying particulate matter and aggravating the respiratory health of those who have allergies (Scripps Health 2012; UCSD 2016). Fullerton is often affected by Santa Ana winds blowing through the Santa Ana Mountain range. Santa Ana winds are a leading cause of wildfires in California. More information on this is available in the “Fire” section.

Generally, winds are measured using the Beaufort scale, developed in 1805, which categorizes wind events on a scale of force 0 to force 12 using their speed and impacts. Any wind that is classified as force 9 or above is generally considered to be a severe wind event. **Table 3-14** shows how the Beaufort scale classifies wind events in detail.

TABLE 3-14: BEAUFORT SCALE

Force	Speed (mph)	Description
0	0 to 1	Calm: Smoke rises vertically and the sea is flat
1	1 to 3	Light air: The direction of wind is shown by smoke drift, but not wind vanes.
2	4 to 7	Light breeze: Wind is felt on the face, leaves rustle, and wind vanes are moved. Small wavelets appear on the ocean, but do not break.
3	8 to 12	Gentle breeze: Leaves and small twigs are in motion, and light flags are extended. Large wavelets appear on the ocean and crests begin to break.
4	13 to 18	Moderate breeze: Dust and loose paper become airborne, and small branches are moved. Small waves appear on the ocean.
5	19 to 24	Fresh breeze: Small trees begin to sway and moderate waves form.
6	25 to 31	Strong breeze: Large branches are in motion, and using an umbrella becomes difficult. Large waves begin to form.
7	32 to 38	Near gale: Whole trees are in motion and walking against the wind can be hard. Foam from breaking waves is blown in streaks.
8	39 to 46	Gale: Walking is difficult and twigs break off trees.
9	47 to 54	Severe gale: Slight structural damage. Crests of waves begin to topple.
10	55 to 63	Storm: Trees are uprooted and considerable damage to structures. Very high waves form in long, overhanging crests.
11	63 to 72	Violent storm: Widespread damage. Exceptionally high waves form, and the ocean is completely covered in foam.
12	73 and above	Hurricane: Devastating damage. On the ocean, the air is filled with foam and spray.

Source: NWS 2018.

Tornado: Tornado events are measured with the Enhanced Fujita (EF) scale. The EF scale uses observations of tornado damage, rather than the actual wind speed itself, as the measure. **Table 3-15** shows the EF scale.

TABLE 3-15: ENHANCED FUJITA SCALE

Rating	Speed (mph)	Description
EF0	65 to 85	Light damage: There is some damage to chimneys, branches are broken off trees, and shallow-rooted trees fall. Signboards damaged.
EF1	86 to 110	Moderate damage: Surfaces are peeled off roofs, and moving vehicles are blown off roads. Mobile homes are pushed off foundations or overturned.
EF2	111 to 135	Considerable damage: Mobile homes are demolished, and roofs are torn off framed houses. Large trees are snapped or uprooted, and light objects become missiles. Cars are lifted off the ground.
EF3	136 to 165	Severe damage: Roofs and some walls are torn off well-constructed houses. Trains are overturned, and most trees in forests are uprooted. Heavy cars are lifted and thrown.
EF4	166 to 200	Devastating damage: Well-constructed houses are leveled, and structures with weak foundations are blown away. Cars are thrown, and large objects become missiles.
EF5	201 and above	Incredible damage: Strong frame houses are leveled and blown away. Vehicle-sized objects are thrown over 300 feet. Bark is stripped off trees, and incredible phenomena occur.

Source: NOAA 2006a, 2006b.

Past Events

Extreme Heat: Historically, Fullerton has, on average, experienced four extreme heat days per year between 1960 and 1990 (Cal-Adapt 2018). More recent local temperature data measured by the Fullerton Municipal Airport indicates that highest monthly mean maximum temperature in Fullerton between the years 2000 and 2019 occurred in September 2012, with the mean maximum temperature recorded at 92.7°F (NWS 2019). Given that the threshold for extreme heat days is five degrees hotter at a 98.4°F, it is clear that extreme heat days are not a regular occurrence in Fullerton’s history.

On occasion, however, Fullerton has experienced days of extreme heat:

- On September 1, 2017, southern California felt the brunt of a heat wave that caused temperatures to exceed 100°F in Inland Orange County. (NOAA 2018a)
- On October 23, 2017, the entire Southern California region was hit by a heat wave that lasted until the 25th. Fullerton Airport measured a peak temperature of 104°F on the 24th. (NOAA 2018a)
- In July 2018, heat waves continually impacted Southern California throughout the month, breaking heat records across the region. The maximum temperature on July 6 in Los Angeles was 111°F and in Santa Ana was 114°F. A second, less-powerful heat wave hit on July 25. (Arango 2018; Serna and Newberry 2018)

Heavy Rain: Fullerton has experienced heavy rain events that have inundated the community. Most recently, Fullerton was affected by a series of strong storms in the winter of 2016 and early 2017 that brought immense rainfall to California, including Fullerton (Coats 2017; Graham 2016). In 2014 heavy rains affecting most of southern California caused flooding on sections of Bastanchury Road that was nearly a foot deep. Nearby weather stations reported that more than an inch of rain fell in a span of three hours. In December 2013, rain showers poured on the coastal and inland areas of southern California, depositing between a quarter inch to half an inch of rain. Sections of Orange County between Placentia and Yorba Linda were affected, and streets in Anaheim were flooded. In January 2010, a strong storm delivered by the jet stream caused urban flooding throughout Southern California. The roof of a medical facility in nearby Santa Ana caved in due to the heavy rain (NOAA 2018a). Other past heavy rain events are included in the list of historical floods earlier in this chapter.

Severe Wind: There have been several strong wind events recorded in and around Fullerton (NOAA 2010, 2018a):

- In November 1957, Santa Ana winds exacerbated wildland fires, endangered air traffic, and triggered sandstorms in the Fontana area.
- In April 1962, strong Santa Ana winds howled throughout the region, uprooting trees, causing property damage and interrupting power transmission to customers.
- In November 1996, Santa Ana winds blew at 35 to 45 miles per hour throughout most of southern California, although winds were recorded close to 100 miles per hour in certain areas. In December 1996, gusts were recorded in Fremont Canyon near Tustin at 111 miles per hour. Injuries were recorded in Huntington Beach when a 60-foot tree was uprooted by the winds and fell on top of people.
- In October 1997, a fire caused by scrap metal was carried by 45-mile-per-hour Santa Ana winds throughout the Santa Ana Mountains, causing widespread property damage in eastern Orange County.
- In October 1998, a thunderstorm sent destructive winds through Orange County. Trees everywhere were uprooted and blown onto vehicles and buildings. A power outage affected more than 18,000 utility customers across the communities of Los Alamitos, Rossmor, Cypress, Tustin, Santa Ana, and Garden Grove.
- In October 2007, winds up to 85 miles per hour blew through Fremont Canyon near Tustin. These winds caused extensive damage to houses and vehicles. The winds also exacerbated existing wildland fires, causing widespread evacuations and the burning of more than 49,000 acres.
- In November 2008, strong Santa Ana winds exacerbated and spread the Freeway Complex Fire, one of the most destructive fires in Southern California history. More than 30,000 acres were burned.

Tornado: There are no documented events of tornadoes occurring within Fullerton. Some tornadoes or near tornado events have occurred in the surrounding area, however. Specifically:

- A tornado in March 1952 struck Santa Monica, killing three people and damaging some property.
- In February 1962, a tornado occurred in Irvine which uprooted trees and felled some utility poles.
- A series of tornadoes began in El Segundo and Huntington Beach in February 1978 which blew over utility poles and uprooted trees onto cars. Six people were also injured. In total, the tornadoes caused up to \$3 million in property damage.
- In March 1986, a tornado impacted Anaheim and damaged some buildings in 1.25-mile-long path.
- Across December 2004 and January 2005, a series of funnel clouds was observed in Fullerton, but a tornado was never generated (NOAA 2010).

In terms of fire-generated tornadoes or tornado-like events, the most recent example occurred during the Carr Fire in Northern California. Intense heat from the blaze created a rotating cloud of wind and smoke that was reportedly six miles high. The observed damage from these winds was similar to that caused by winds of 140 mph or higher (Holthaus 2018).

Risk of Future Events

Extreme Heat: Extreme heat events occur annually in Fullerton a few times each year. All expectations are that the probability they will occur again in the future is highly likely and anticipated to increase in the future.

Heavy Rain: There is no indication that rainfall or severe rain hazards will abate either in Fullerton or the greater region of Southern California in the future. While Fullerton may experience prolonged periods of dry or wet years, all expectations are that the probability they will occur again in the future is highly likely and anticipated to increase in the future.

Severe Wind: Given Fullerton's history of severe wind events, it is very likely that wind events will continue to impact the city. The most probable source of wind events in the future will likely originate from the Santa Ana winds or extreme storms. All expectations are that the probability they will occur again in the future is highly likely.

Tornado: While there is a chance that a tornado could emerge in Fullerton or begin somewhere else in Orange County and enter the city's boundaries, the rarity of the specific wind conditions that lead to tornadoes means that the risk of a tornado impacting Fullerton is low.

Climate Change Considerations

Extreme Heat: The primary effect of climate change is warmer overall global temperatures. In fact, the five hottest years on record have been within the last decade (Climate Central 2018). Among these, 2016 was the hottest year on record, and 2017 was the second hottest (WMO 2018). It is expected that these warming trends will continue and therefore bring the potential for hotter, more frequent extreme heat events. For Fullerton specifically, it is predicted that the average number of extreme heat days per year could increase from 4 to 16 or even 30 by the end of the 21st century (Cal Adapt 2018).

Heavy Rain: Climate change is expected to alter rainfall patterns in southern California, including Fullerton. As the climate warms, rain events are predicted to become more intense. It is likely that Fullerton will experience more rain inundation events that lead to flooding, erosion, dam failure, tree mortality, and other potential hazards.

Severe Wind: It is anticipated that the atmospheric rivers that deliver storms to Southern California may intensify as a result of climate change. While the average number of storms in Southern California will remain more or less the same, storms are expected to increase in strength by 10 to 20 percent (Oskin 2014). This increase in storm intensity may also bring more intense winds to the Southern California region, including Fullerton. It is not yet known if climate change will affect the frequency or intensity of Santa Ana wind events.

Tornado: It is not generally known whether or not climate change will increase the number of tornadoes in Southern California. Climate change will likely lead to more frequent and more powerful fires, though, which could set the stage for more fire-generated tornadoes (Holthaus 2018). Given how rare extremely powerful fires of this nature are in Fullerton, however, the risk of a fire-generated tornado occurring that could impact the city is low.

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CHAPTER 4

THREAT ASSESSMENT

Chapter 3 discussed the hazards that are at risk of occurring in City of Fullerton. Whereas “risk” is defined as the possibility that an event will occur, a hazard “threat” is the potential harm to people, ecosystems, buildings, and economic activity.

This chapter discusses the key facilities and population that is threatened by hazards. It also discusses how certain assets or populations are more vulnerable to hardship caused by a hazard and may find it more difficult preparing for, evacuating from, or recovering from a hazard event. This chapter summarizes the physical threat to critical facilities and facilities of concern, the social threat to vulnerable populations, and threats to the economy, transportation system, or environment or other areas of concern.

KEY FACILITIES

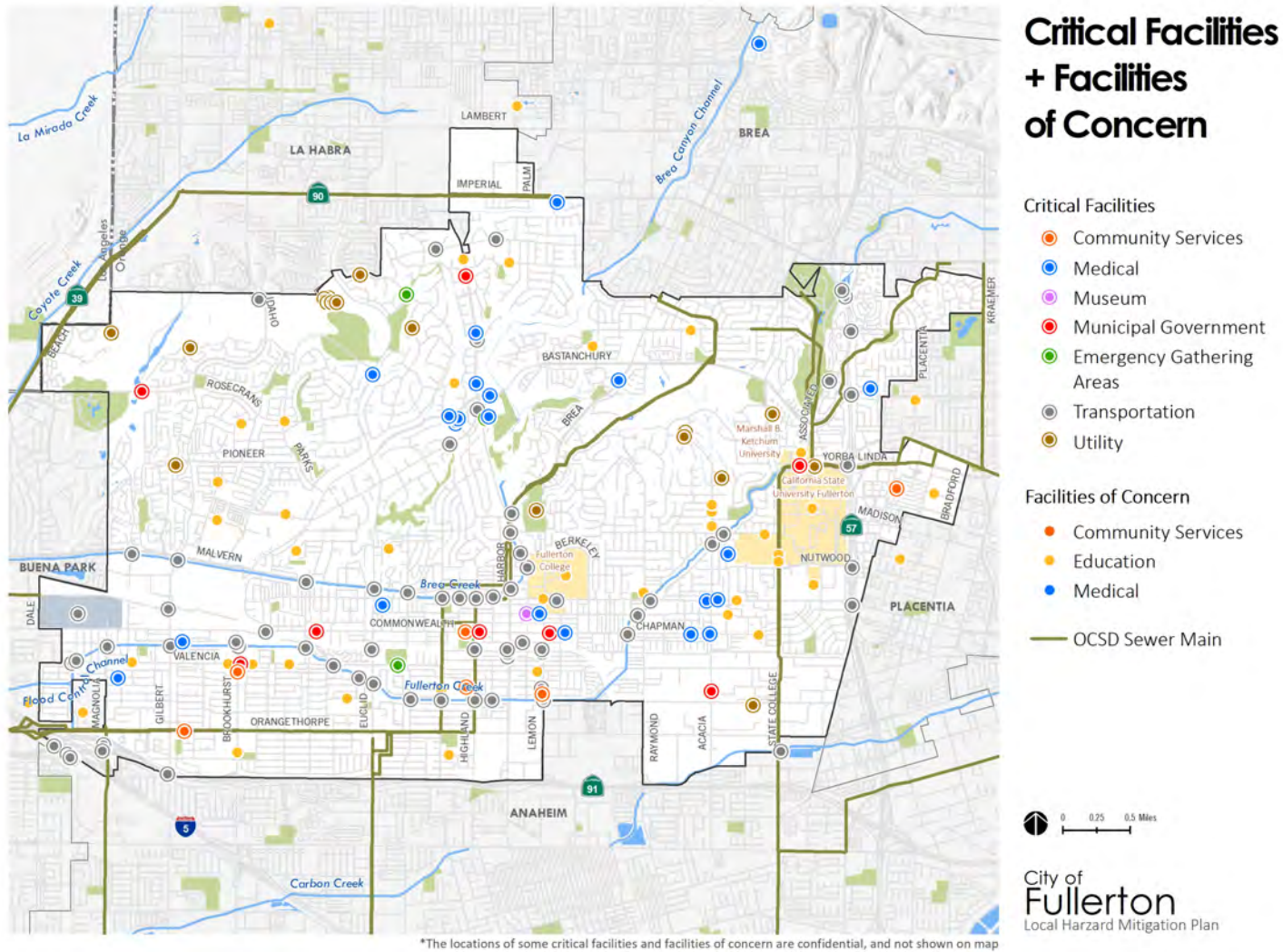
Critical facilities are properties that should receive priority in recovery efforts because they serve important functions in the execution and provision of emergency services to the City. Critical facilities in Fullerton include City administration buildings, water tanks and pumps, public safety buildings such as police and fire stations, schools, and bases of operations for City maintenance activities. These facilities may also serve as assembly points or temporary shelters or play a supportive role in preparing for and recovering from hazard events. Facilities of concern are not critical for City operations but could have elevated risk. Critical facilities and facilities of concern may be owned by the City, other agencies, or private companies.

The Hazard Mitigation Planning Committee identified 167 critical facilities and 69 facilities of concern that fall into several different categories based on their function. These facilities were chosen based on the city’s determination as well as their jurisdiction over them. Schools are community resources owned and operated by the local school districts. The City actively coordinates with these districts to ensure the facilities can help support emergency management needs. **Table 4-1** shows the number of critical facilities and facilities of concern in each category, the total estimated value of the facilities in each category, and examples of the facilities in each. **Appendix D** has a complete list of the critical facilities and facilities of concern. **Figure 4-1** maps all of the critical facilities and facilities of concern in Fullerton within their geographic context. Some facilities are not shown on the map due to security concerns about their locations.

The threat assessment for critical facilities looks at the number and types of facilities that lie within the areas of elevated risk for different hazards. Hazard events may damage or destroy these facilities, leaving them unable to function or with limited capacity. Repair or reconstruction work may be necessary to make these facilities fully operational. Facilities outside of the elevated risk hazard areas may still be affected by hazards, although the risk (and therefore chance of damage) is lower.

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Figure 4-1: Map of Critical Facilities and Facilities of Concern in Fullerton



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TABLE 4-1: FULLERTON KEY FACILITIES

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	5	3	8
Education	0	44	44
Emergency Gathering Areas	5	0	5
Energy	2	0	2
Medical	1	22	23
Museum	1	0	1
Municipal Government	9	0	9
Transportation	71	0	71
Utility	33	0	33
Water and Sewage	40	0	40
Total	167	69	236

VULNERABLE POPULATIONS

The threat analysis identifies segments of the population that may be disproportionately impacted by hazard events in relationship to where these hazards occur. A hazard event can have very different impacts on groups or individuals, based on their age, socioeconomic status, physical and mental condition, and other demographic factors or living conditions that affect their resilience to natural hazards. For example, a hurricane or other severe weather event can have a greater impact on older adults who suffer from chronic illnesses and may become unable to take their medications or access the services or technologies that they depend on.

Households with the following characteristics may be more vulnerable to hazard events:

- **Households with at least one person with a disability.** Households in which a person living with a disability lives alone or lives with others. Persons with disabilities may have reduced mobility may rely on others for care. Depending on their disability, they may not have the resources or ability to protect or mitigate damages to their homes or property.
- **Households living below the poverty level.** Households with an income below the poverty level are less likely to have the financial resources to prepare for or cope with the impacts of hazard events. For a family of four, the annual household income for a household living below the poverty level is \$25,100 (Heathcare.gov, 2018). If a hazard event significantly disrupts the local economy, they could face significant hardship recovering from the event.
- **Households with at least one person over 65.** Persons over the age of 65 may have limited mobility or suffer from medical conditions. A hazard event could exacerbate existing health complications or injuries in the aftermath of an event. Senior citizens living alone are especially at risk because they may have a more difficult time getting needed assistance before, during, or after a hazard event.

- Renter Households:** Renter households may have limited control over the resilience of their home. They could be unaware of signs of disrepair or more serious structural conditions. They may be subject to negligence from absentee or unresponsive landlords and live in unsafe housing conditions that are left unaddressed. Some renter households, especially undocumented, lower-income, or immigrant households, may not report safety issues or code violations to authorities out of fear of landlord retaliation or jeopardizing their jobs, housing stability, or residency. Almost half of households in Fullerton are renters.

The following tables show the population and households within Fullerton, as well as the percentage of people within a group that could be more vulnerable.

TABLE 4-2: FULLERTON POPULATION AND HOUSEHOLDS

City of Fullerton	Total
Population	139,044
Households	44,929
Median Household Income (adjusted to 2018 \$)	\$74,642

Sources: ACS Estimates 2012-2016; ESRI 2018 Demographic and Income Profile.

TABLE 4-3: FULLERTON VULNERABLE POPULATIONS

Vulnerable Population Metric	%
Percentage of renter households	46%
Percentage of households with at least one person living with a disability	20%
Percentage of households living under poverty limit	13%
Percentage of population aged 65+	12%
Percentage of 65+ population living alone	21%

Sources: ACS Estimates 2012-2016; ESRI 2018 Demographic and Income Profile.

There are other groups that may be more vulnerable during a hazard event than the general population—such as people living in homelessness, undocumented immigrants, persons who live with certain chronic diseases, persons who are socially isolated, or households that live in areas with limited vehicular access. These groups are vulnerable because they may experience greater hardship evacuating or recovering from a hazard event than the general population. The most recent federally mandated, “point-in-time” count of the homeless population in Orange County was conducted in April of 2018 and revealed that the overall homeless population in Northern Orange County had increased from 2017, including the homeless population in Fullerton. Specifically, 1,837 homeless individuals were counted among Northern Orange County cities, including: Anaheim, Brea, Buena Park, Cypress, Fullerton, La Habra, Los Alamitos, Orange, Placentia, Stanton, Villa Park, and Yorba Linda (Replogle 2019). While localized data for Fullerton’s portion of the homeless population is not available at this time, a hazard event that strikes any of these cities or a regional hazard event that impacts all of Northern Orange County simultaneously can impact the homeless population and cause migrations of homeless individuals and groups across city borders. This could lead to an overwhelming of local homeless services.

OTHER COMMUNITY ASSETS

Other features or aspects of a community, such as important services, infrastructure networks, natural ecosystems, or local economic activities could also be disproportionately affected by a hazard event.

THREAT PROFILES

DAM FAILURE

Physical Threat

As mentioned in Chapter 3, dam inundation flooding as a result of a dam failure can be very destructive due to the quantity of water that is released in a short period of time. A dam failure can be caused by an earthquake or other strong force or as a result of structural issue, such as an eroded embankment or flood control channel.

Table 4-4 shows the key facilities threatened by flooding hazards from at least one dam. The threat of dam inundation in Fullerton is high due to the presence of multiple dams surrounding the City. Dam inundation would primarily affect the flatter, lower elevation southern section of the city, potentially impacting 133 key facilities. The boundaries of dam inundation maps show downstream areas that would be inundated by at least two feet of water. Several bridges, nursing facilities, hospitals, educational facilities, and municipal divisions are in the path of one or more dam inundation areas. **Figure 4-2** shows the critical facilities and facilities of concern located within dam inundation areas. When the flood inundation waters from the dam failure event reach these facilities, they can their impede operations through short circuiting any unprotected power equipment. Any amenities or small structures, such as seating or portable sheds, at these facilities that are not securely fastened would likely be toppled by the force of the flood waters. Any underground rooms with apertures to the surface would likely become flooded.

Some dams pose a greater threat than others due to their capacity and operational status. According to the Army Corps of Engineers Dam Safety ratings, the Carbon Canyon, Prado, and Brea Dams are at a high risk of failure. Because of their size, they would also cause a significant degree of environmental, social, and economic damage if they failed (Army Corps n.d.b). Fullerton Dam presents a moderate to high risk of failure. The OC Reservoir has not been given a Dam Safety rating; however, this assessment has determined it presents a low threat to residents and key facilities.

Prado Dam

Table 4-5 shows the key facilities that are in the inundation path of Prado Dam. Prado Dam has a storage capacity of almost 217,000 acre-feet (Army Corps n.d.a). Due to its large storage capacity, the dam could inundate several cities in Orange County if it failed, assuming all the water was released at once. More minor breaches would likely have less severe impacts. In Fullerton, a failure of Prado Dam could impact 78 critical facilities and 22 facilities of concern.

TABLE 4-4: FACILITIES AT RISK OF DAM FAILURE INUNDATION BY ALL DAMS

Facility Type	Critical Facility	Facility of Concern	Grand Total
Community Services	5	1	6
Education	0	25	25
Energy	2	0	2
Medical	0	10	10
Museum	1	0	1
Municipal Government Division	7	0	7
Emergency Gathering Areas	3	0	3
Transportation	57	0	57
Utility	4	0	4
Water and Sewage	18	0	18
Grand Total	97	36	133

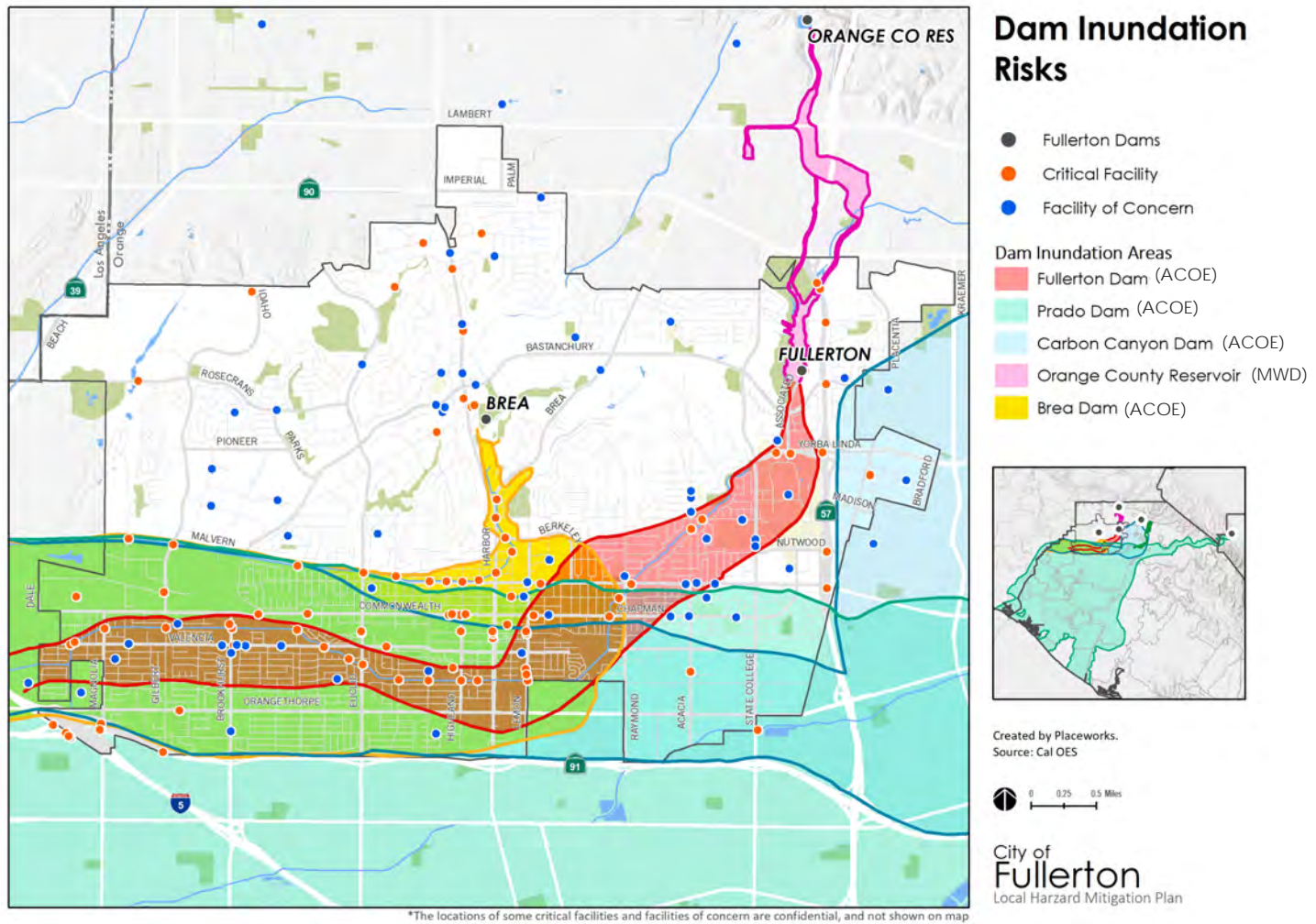
TABLE 4-5: PRADO DAM INUNDATION AREA

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	5	1	6
Education	0	14	14
Emergency Gathering Areas	2	0	2
Medical	0	7	7
Museum	1	0	1
Transportation	42	0	42
Municipal Government	6	0	6
Total	56	22	78

Carbon Canyon

Table 4-6 shows the key facilities that are in the inundation path of Carbon Canyon Dam. A failure of Carbon Canyon Dam could impact 51 critical facilities and 15 facilities of concern, including several schools and transportation routes. Floodwaters from an inundation of this dam could affect neighborhoods north of State Route 91 and south of Chapman Avenue.

Figure 4-2: Critical Facilities and Facilities of Concern in Dam Inundation Areas



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TABLE 4-6: CARBON CANYON DAM INUNDATION AREA

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	3	1	4
Education	0	12	12
Emergency Gathering Areas	1	0	1
Medical	0	2	2
Transportation	29	0	29
Municipal Government	3	0	3
Total	36	15	51

Brea Dam

Table 4-7 shows the key facilities that are in the inundation path of Brea Dam. A failure of the Brea Dam would impact 58 critical facilities and 20 facilities of concern. Brea Dam’s inundation path could potentially affect the neighborhoods in the city south of Malvern Avenue and west of Raymond Avenue.

TABLE 4-7: BREDA DAM INUNDATION AREA

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	4	1	5
Education	0	14	14
Emergency Gathering Areas	3	0	3
Medical	0	5	5
Museum	1	0	1
Transportation	45	0	45
Municipal Government	5	0	5
Total	58	20	78

Fullerton Dam

Table 4-8 shows the key facilities that are in the inundation path of Fullerton Dam. A failure of the Fullerton Dam would impact 29 critical facilities and 20 facilities of concern. A breach of the Fullerton Dam would flow from the dam’s location north of the California State University campus southwest along the Fullerton Creek. The flood channel would play a role in mitigating the threat of a potential inundation.

OC Reservoir

The dam failure of the OC reservoir is unlikely to affect any households or key facilities. The reservoir’s inundation area would be limited to Craig Regional Park as the inundation area for the OC Reservoir dam is largely outside of Fullerton’s city boundaries and the small section that crosses into Fullerton is contained by the reservoir of Fullerton Dam. In a scenario where the reservoir of Fullerton Dam may be full, and the dam compromised structurally it is possible that a sudden release of water from a breach of

the OC Reservoir could overwhelm the Fullerton Dam and cause it to also breach but such a scenario is highly unlikely.

Social Threat

A dam failure event could cause significant destruction, particularly if there is little or no advance warning. Residents could quickly lose access to water, power, roads, communication services, and transportation routes.

Table 4-9 shows the social vulnerability of the dam inundation zone. Almost half or more households in a dam inundation zone are renters. Additionally, there are a greater number of households living in poverty in potential dam inundation areas compared to the City as a whole. Households in these areas have a lower average median household income compared to the City average, indicating that this population would have less disposable income to recover from a dam inundation event.

TABLE 4-8: FULLERTON DAM INUNDATION AREA

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	2	1	3
Education	0	13	13
Medical	0	6	6
Transportation	23	0	23
Utility	1	0	1
Municipal Government	3	0	3
Total	29	20	49

TABLE 4-9: DAM INUNDATION ZONE, THREATENED POPULATION METRICS

Threatened Population Metric	Brea Dam	Carbon Canyon Dam	Prado Dam	Fullerton Dam	Orange County Reservoir	City of Fullerton
Population	54,863	58,892	58,924	29,878	0	139,044
Households	16,166	17,579	17,340	8,273	0	44,929
Median household income (adjusted to 2018 \$)	\$59,526	\$54,779	\$59,410	\$63,234	0	\$74,642
Renter Households	55%	59%	55%	48%	0	46%
Percentage of households with at least one person living with a disability	22%	19%	22%	22%	0	20%
Percentage of households living under poverty limit	17%	17%	17%	16%	0	13%
Percentage of population aged 65+	9%	8%	9%	11%	0	12%
Percentage of 65+ population living alone	21%	20%	21%	21%	0	21%

Sources: ACS Estimates 2012-2016; ESRI 2018 Demographic and Income Profile.

DISEASES AND PESTS

Physical Threat

It is unlikely that diseases would pose any physical threat to key facilities in Fullerton.

Social Threat

A disease epidemic could affect everyone in Fullerton to some degree, from a mild inconvenience to a fatal condition. Vulnerability is highly dependent on the type of disease, but in general, pregnant women, senior citizens, young persons, people with weakened immune systems, and people living in homelessness face the greatest threat. Persons who live alone and become significantly ill—especially senior citizens and persons with disabilities—could face an elevated threat if they are unable to take care of themselves. Additionally, a large concentration of vulnerable persons living together could lead to a widespread epidemic. Of particular concern are isolated communities with a large population of infirm or vulnerable groups, such as nursing homes or retirement communities.

Other Threats

A major outbreak of a disease could stress healthcare facilities and systems in and around Fullerton, potentially causing a decline in medical services. Such an outbreak could also prevent many people from going to work, which would harm the economy and affect the quality of many local services.

DROUGHT

Physical Threat

Drought is a regional issue that could affect all areas and critical facilities throughout the City. The primary threat from drought events is a reduced water supply, which would most directly impact the City's water supply. Reduced rainfall leads to a reduction in groundwater recharge, which is the primary water source for the City. While droughts of short duration may not impact the groundwater aquifer, prolonged periods of drought may affect the City's ability to sustainably withdraw water.

Drought also has a number of secondary impacts that could affect the City and its critical facilities. Reduced precipitation and irrigation resulting from drought can affect plants and vegetation increasing the risk of fire. In addition, during prolonged drought trees can become stressed making them susceptible to disease and/or prone to falling over or experiencing damage due to sudden branch drop syndrome. These impacts typically occur as a result of strong winds that can stress the trees limbs and root systems. This is a particular concern in the West Coyote Hills, which has a very high potential for wildfire risks, and the East Coyote Hills, which includes the Panorama Nature Preserve and other open spaces (CAL FIRE 2011). In 2015, almost 70 trees in Hillcrest Park died from the drought, including mature trees (Ponsi 2015).

Key critical facilities susceptible during a drought include water pumps and water delivery infrastructure, which may require modification if groundwater elevations decrease significantly requiring wells to be drilled deeper into the aquifer. In addition, flood control infrastructure, and wastewater systems may be impacted, because lower rates of storm water runoff and sewage conveyance, would decrease flows,

which could allow solid materials and trash to accumulate and clog systems (Schwab 2013). These types of damages can be subtle and occur over a long period (Schwab 2013).

Social Threat

In urbanized areas, social threats stemming from droughts or water shortage may become extreme enough that public health is at risk. If water supply is extremely curtailed or permanently interrupted, significant health impacts could occur. While this is highly unlikely, a prolonged drought occurring over several years could require the City to take extreme measures to reduce water consumption. Typically, these measures include incentivizing use reduction and installation of efficient technologies that rely on less water. If the drought persists or consumption doesn't align with available water supplies, jurisdictions typically resort to financial mechanisms (incentives/disincentives) that reduce water demand. Ultimately prolonged droughts have a tendency to increase the costs of water production, due to increased pumping costs from deeper parts of the aquifer, enhanced treatment due to concentration of constituents in the water, and reduced revenues due to the reduction in water usage. While most households in the City may be able to absorb these cost increases, lower income households may struggle with this added expense, placing greater stress on this segment of the population.

Other Threat

A drought could have far-reaching regional health and environmental impacts, all of which cannot be sufficiently addressed in this report. One of the most serious consequences is that a region can deplete its groundwater supply during prolonged-droughts. Droughts can also affect the recreational and aesthetics features of a community. On a community scale, it can negatively impact large, shady mature trees that would take years to replace. The cost of coping with a drought, including infrastructure repairs and open space maintenance and can absorb a high percentage of the city's budget.

FIRE

Physical Threat

There are approximately 44 key facilities located within a Fire Hazard Severity Zone (FHSZ). The majority of these are water pumps or sewage facilities, creating a significant risk to the city's water infrastructure. Water pumps can fail if they lose power during a fire, hampering firefighting efforts. Additionally, excessive water use from firefighting efforts can lower water pressure in pipes and raise the risk of contamination. Lower water pressure can cause non-potable water to backflow or make it easier for contaminants to be drawn in (USEPA 2002).

As shown in **Table 4-10**, there are a number of medical-related facilities, such as assisted living and nursing facilities, in the wildfire hazard zone. In the event of a wildfire, these facilities may require specialized evacuation to ensure the safety of their occupants due to the high vulnerability of the persons living in these facilities. **Figure 4-3** shows the critical facilities and facilities of concern located in fire hazard severity zones.

TABLE 4-10: KEY FACILITIES THREATENED BY WILDFIRE

Facility Type	Moderate Fire Hazard Severity Zone	High Fire Hazard Severity Zone	Very High Fire Hazard Severity Zone	Total
Emergency Gathering Areas ¹	0	1	1	2
Medical ²	1	2	2	5
Municipal Government ¹	0	0	1	1
Transportation ¹	2	0	1	3
Water and Sewage ¹	3	4	26	33
Total	6	7	31	44

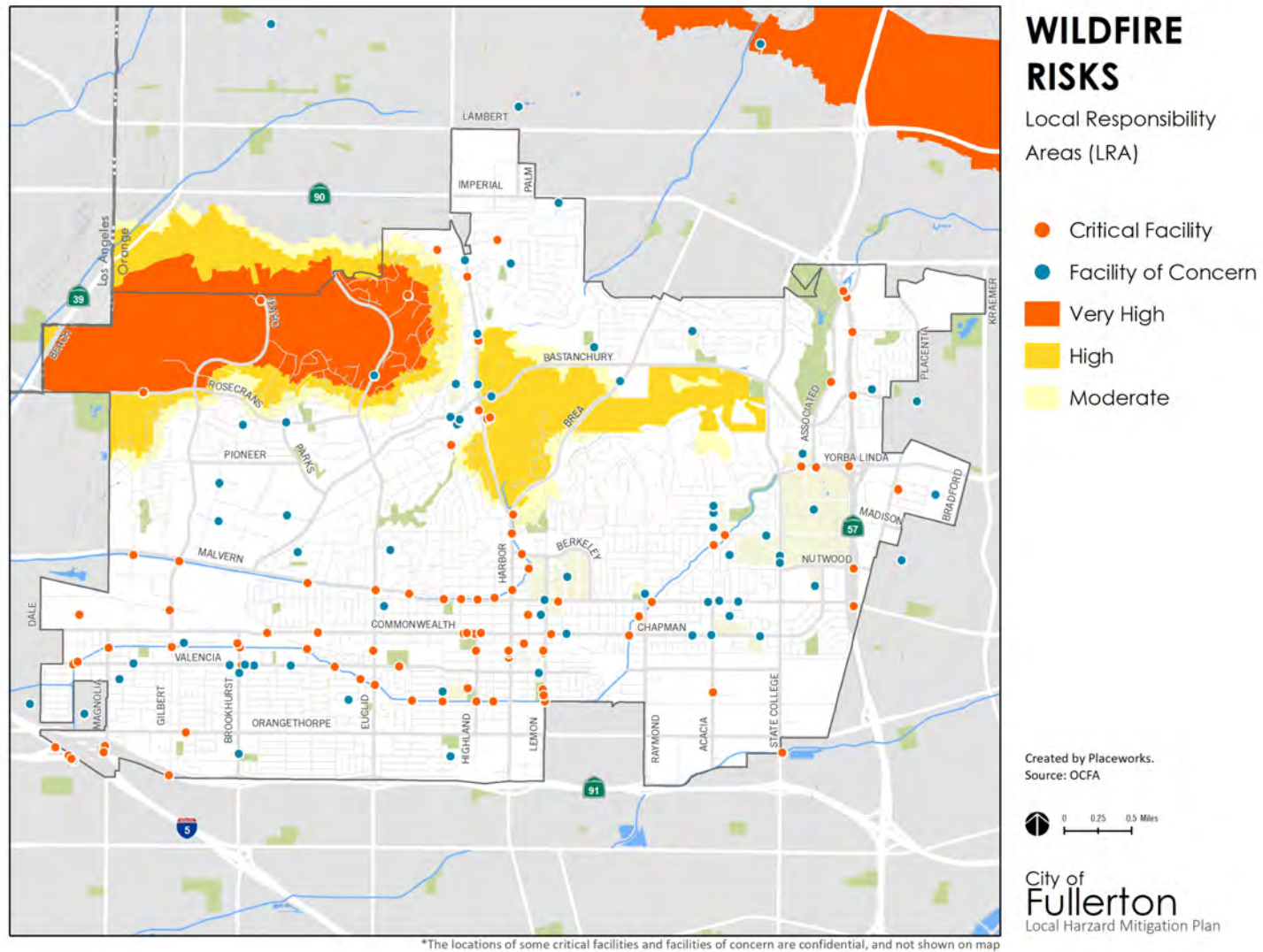
¹ – Critical Facilities
² – Facilities of Concern

Social Threat

Fullerton’s wildfire hazard zones are home to approximately 14,600 residents, most of whom live in the Very High FHSZ, as shown in **Table 4-11**. Of the vulnerable populations, there is a large population of seniors (over 65) living in an FHSZ. Nearly one quarter (22 percent) of the population living within a medium, high, or very high FHSZ are seniors, compared to 12 percent within the City as a whole. In the moderate and high FHSZ, 24 percent of residents are seniors. In the very high FHSZ, 18 percent of the populations are seniors. Senior residents could be living with disabilities or debilitating medical conditions, have limited mobility options, or rely on caregivers for assistance. They may rely on medication, service animals, wheelchairs, or walkers or require family assistance when evacuating their homes (American Red Cross 2009).

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Figure 4-3: Critical Facilities and Facilities of Concern in Fire Hazard Severity Zones in Fullerton



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TABLE 4-11: FIRE HAZARD SEVERITY ZONE THREATENED POPULATIONS

Threatened Population Metric	Moderate and High Fire Hazard Severity Zone	Very High Fire Hazard Severity Zone	City of Fullerton
Population	9,882	4,701	139,044
Households	3,277	1,571	44,929
Median household income (adjusted to 2018 \$)	\$117,435	\$121,154	\$74,642
Renter Households	19%	15%	46%
Percentage of households with at least one person living with a disability	23%	23%	20%
Percentage of households living under poverty limit	4%	6%	13%
Percentage of population aged 65+	24%	18%	12%
Percentage of 65+ population living alone	19%	19%	21%

Other Threat

Large wildfires can have a costly and devastating toll on a community. Approximately 60 percent of the land uses within the FHSZ are residential. Flying embers can easily ignite the roofs of homes and other buildings that are not constructed with fire-resistant roofs and rapidly spread fire throughout a region. In addition to residential property, wildfires can damage water pipes and cause water contamination. Plastic water pipes can melt under extreme heat and cause ash, debris, and burned plastic resins to contaminate drinking water (Wilson 2018). In the aftermath of a fire, major damages to commercial, medical, or other nonresidential buildings could cause a significant number of people to permanently lose employment.

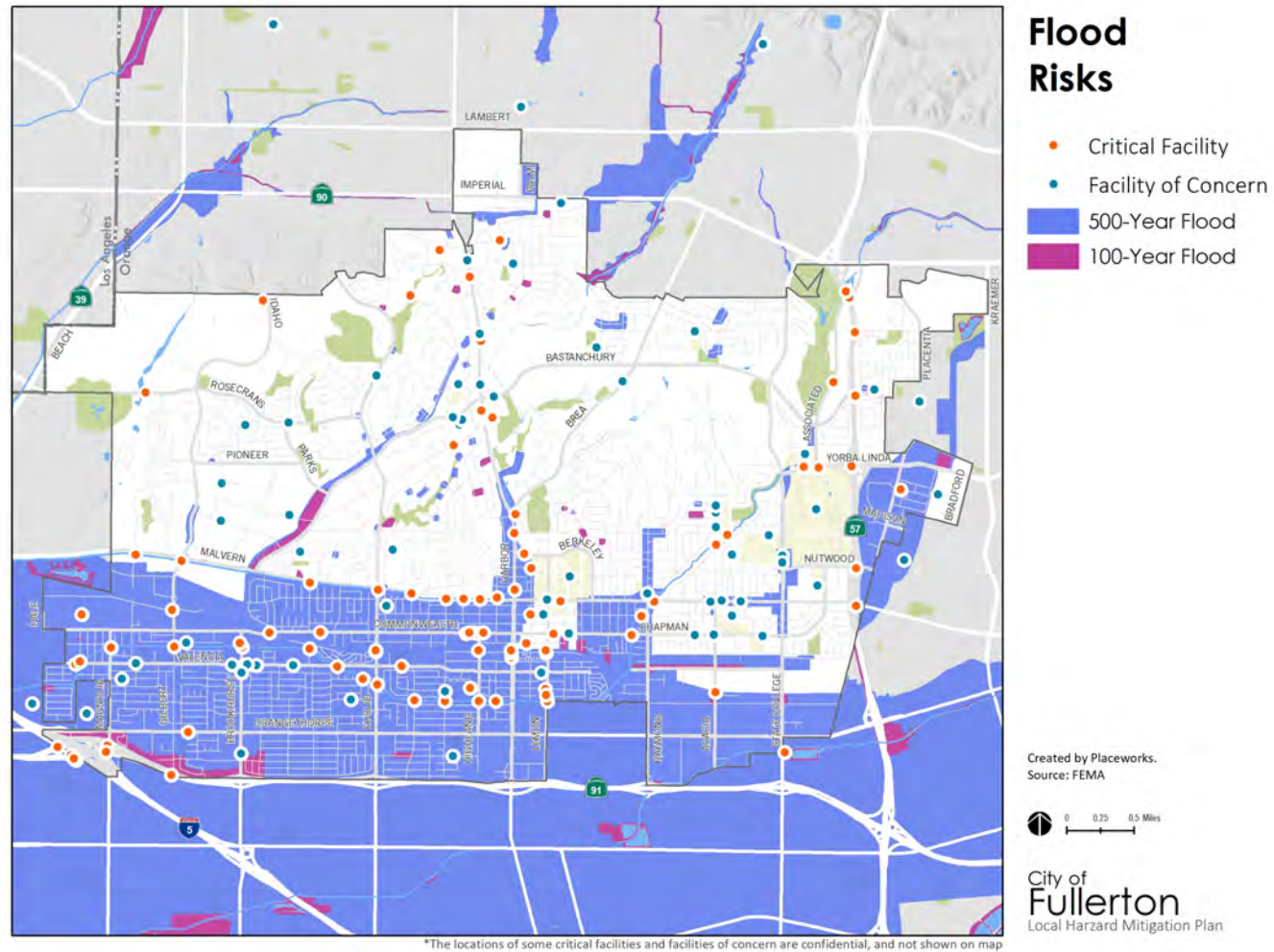
FLOODING

Physical Threat

Flooding from a 100-year or 500-year storm event will primarily affect the southern section of the city, where the terrain is relatively flat. In the event of a major storm, runoff will flow rapidly to southern Fullerton from the higher-elevation northern areas of the city. Whereas a 100-year flood threatens just 2 critical facilities, a 500-year flood threatens 102 key facilities, among these are Fullerton City Hall and Community Center. **Table 4-12** shows the key facilities threatened by flooding in the City. **Figure 4-4** also maps the critical facilities and facilities of concern in Fullerton relative to the floodplain areas. Any facilities inundated with floodwaters are likely to experience power outages if the flood disrupts nearby electrical power grids. Computers and other electronic equipment stored on the ground would become inoperable and destroyed. Streets would become flooded and motorists as well as emergency personnel may not be able to reach their destinations.

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Figure 4-4: Critical Facilities and Facilities of Concern in Fullerton's Floodplains



Map includes Letters of Map Revision through February 23, 2018

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TABLE 4-12: CRITICAL FACILITIES AND FACILITIES OF CONCERN AT RISK OF FLOODING

Facility Type	100-Year Flood		500-Year Flood	
	Facility of Concern	Critical Facility	Facility of Concern	Critical Facility
Community Services	0	0	1	6
Education	0	0	18	0
Energy	0	0	0	2
Medical	0	0	5	0
Municipal Government	0	0	0	5
Emergency Gathering Areas	0	0	0	2
Transportation	0	0	0	49
Utility	0	0	0	2
Water and Sewage	0	2	0	12
Total	0	2	24	78

Social Threat

Approximately 45 percent of Fullerton residents live in either the 100-year or 500-year flood zone. A majority of these households are renters, which means they risk losing their homes after a devastating flood. Whereas a 100-year flood would impact just 2,344 residents, a 500-year flood would directly impact 60,788 persons and 17,962 households. Slightly less than a quarter of the city's households in either the 100-year or 500-year flood zone includes a person living with a disability. Compared to the city as a whole, there are 3 to 4 percent more residents living in poverty in the 100- and 500-year flood zone respectively. Additionally, 7 to 8 percent of people in the 100- and 500-year flood zone are over the age of 65.

Lower-income persons in flood-prone areas may be unable to afford flood insurance premiums or flood-proofing improvements to their homes. Following the aftermath of a flood, they may face homelessness or significant financial losses that are difficult to overcome. Persons 65 years of age or more are more likely to have health conditions that could limit their ability to evacuate or recover from a flood. **Table 4-13** shows the social vulnerability in this hazard zone.

Other Threat

Floodwaters can transport debris that blocks roadways and hinders transit, emergency response services, and evacuations. Serious floods could cause erosion of the soil around utility lines and interrupt services. Damage to a large number of homes or businesses may slow local economic activity.

TABLE 4-13: FLOOD HAZARD ZONE THREATENED POPULATIONS

Threatened Population Metric	100-Year Flood Hazard Zone	500-Year Flood Hazard Zone	City of Fullerton
Population	2,344	60,788	139,044
Households	918	17,962	44,929
Median household income (adjusted to 2018 \$)	\$37,337	\$57,173	\$74,642
Renter Households	74%	58%	46%
Percentage of households with at least one person living with a disability	24%	20%	20%
Percentage of households living under poverty limit	16%	17%	13%
Percentage of population aged 65+	7%	8%	12%
Percentage of 65+ population living alone	23%	21%	21%

Sources: ACS Estimates 2012-2016; ESRI 2018 Demographic and Income Profile.

GEOLOGIC HAZARDS

Landslides/Mudflows

Physical Threat

There are currently three critical facilities, all of which are pump stations, in potential earthquake-induced landslide areas, shown in **Table 4-14**. Although accurate mapping data for rainfall-induced landslide areas is not available, landslides are a risk on all steep hillsides. In areas with steep slopes, long periods of rainfall can trigger a landslide which could impact roads. There are also a number of residences, schools, and nursing or assisted living facilities in the East and West Coyote Hills region that could potentially be impacted by rainfall-induced landslides or roads stalled by debris. **Figure 4-5** shows the critical facilities and facilities of concern that could be impacted by a landslide in Fullerton.

TABLE 4-14: FULLERTON DAM INUNDATION AREA

Facility Type	Critical Facility	Facility of Concern	Total
Utility	3	0	3

Social Threat

As shown in **Table 4-15**, there are 1,532 people and 446 households living within an earthquake-induced landslide zone, which is only a small percentage of the city’s population, and very few of whom are renters. This population does not exhibit a significant social vulnerability in terms of income, age, and disability. However, 37 percent of the senior population in this area lives alone. Seniors, persons with disabilities, and others who have mobility challenges may not be able to hastily evacuate their homes if a force triggers a landslide on their property.

TABLE 4-15: FULLERTON THREATENED-POPULATION METRICS IN EQ- INDUCED LANDSLIDE ZONE

Vulnerable Population Metric	EQ-Induced Landslide Zone	City of Fullerton
Population	1,532	139,044
Households	446	44,929
Median household income (adjusted to 2018 \$)	\$144,783	\$74,642
Renter Households	16%	46%
Percentage of households with at least one person living with a disability	22%	20%
Percentage of households living under poverty limit	6%	13%
Percentage of population aged 65+	12%	12%
Percentage of 65+ population living alone	37%	21%

Sources: ACS Estimates 2012-2016; ESRI 2018 Demographic and Income Profile.

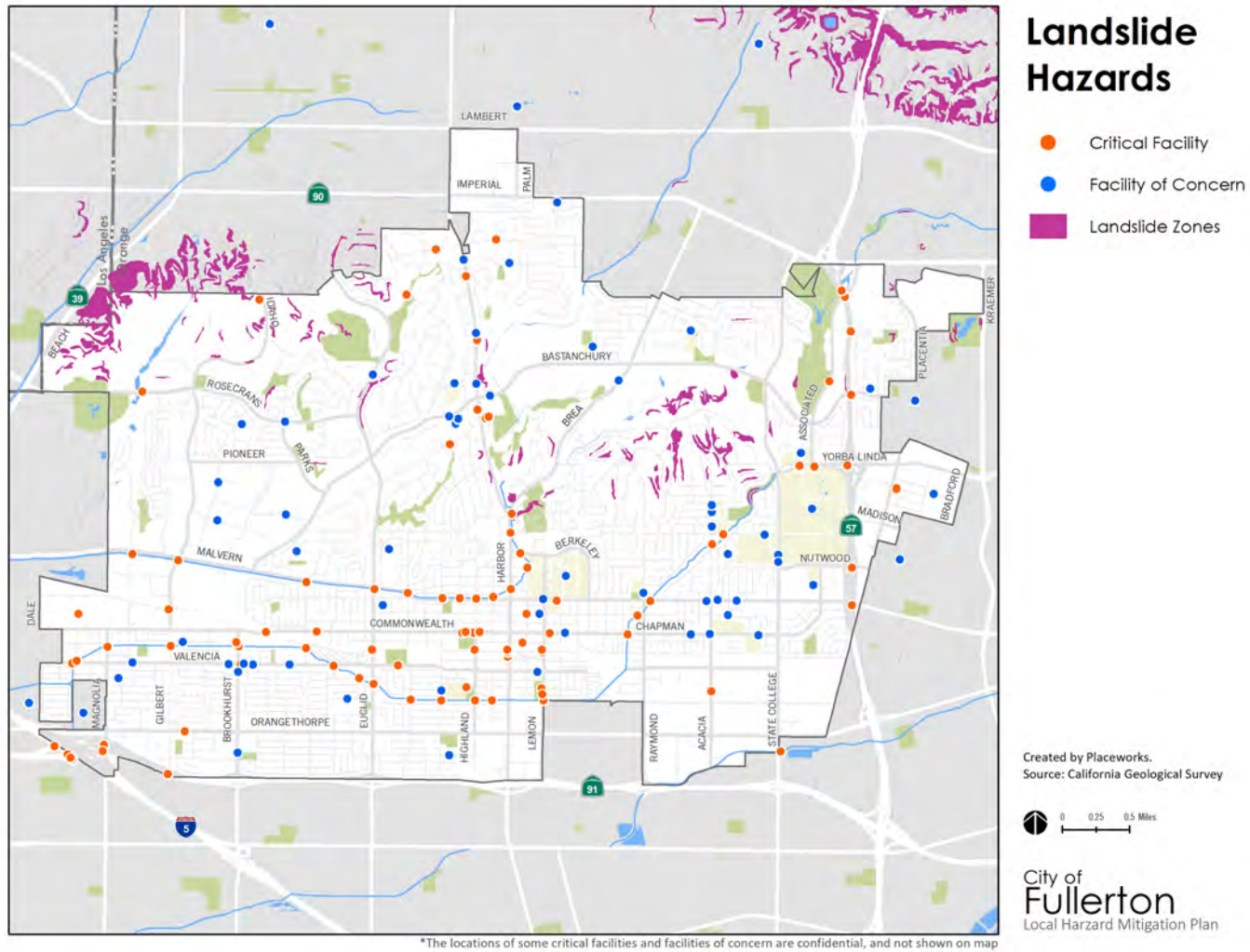
Other Threats

Landslides may block roadways for weeks or even months. Such an event in Fullerton could cause long-term disruptions to the roadway network, hindering emergency response services. Underground utility lines in slide-prone areas or above-ground lines built on or above them, can be damaged in a landslide, causing service outages. Landslides could affect sensitive ecological areas around the community, causing localized harm to the region's ecosystem, although widespread disruptions are unlikely.

Homes and businesses are typically damaged or destroyed by landslides. In addition to potentially causing significant injuries or fatalities, this can cause economic harm and create a need for long-term emergency sheltering and temporary housing until these buildings can be reconstructed. Utility lines, such as power lines or water pipes, may be broken by a landslide, interrupting important services.

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Figure 4-5: Critical Facilities and Facilities of Concern in Landslide Zones in Fullerton



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Subsidence

Physical Threat

There is evidence of current or historical land subsidence in Fullerton as a result of excessive groundwater pumping, particularly in the southern section of the city (USGS 2018). Subsidence can have an effect on both the built and natural environment. Because water lines are gravity driven, a change in elevation as a result of subsidence could make the system more inefficient. Sinking of the ground could also reduce the distance to the groundwater table, which could raise the risk of contamination from hazardous materials. Subsidence could also irreversibly decrease an aquifer's capacity to store water (USGS 2017). Although accurate subsidence mapping data is not available, many important critical facilities could be gradually affected by subsidence in Fullerton and may require further study to examine their function and safety.

Social Threat

Subsidence is a concern for everyone because it could have a significant effect on large-scale systems such as utility infrastructure, open space, and aquifers. In addition, subsidence could affect the safety of homes. Buildings could gradually sink as a result of subsidence, causing minor issues such as cracks or misalignments of doors and windows, or more costly problems such as sinkholes. These issues could impact residents living in older homes, which may not have been built with foundations reinforced with steel. Because insurance companies may not cover damages caused by subsidence or other geologic hazards, lower-income households may find it financially difficult to cope with subsidence.

Other Threats

If subsidence occurred in Fullerton, the impacts could be widespread. In addition to potentially damaging buildings throughout the community, subsidence could damage roads and rail lines as well as underground pipes such as water, wastewater, and natural gas. This could create more congestion on Fullerton's transportation networks and interrupt key utility services.

HAZARDOUS MATERIALS

Physical Threat

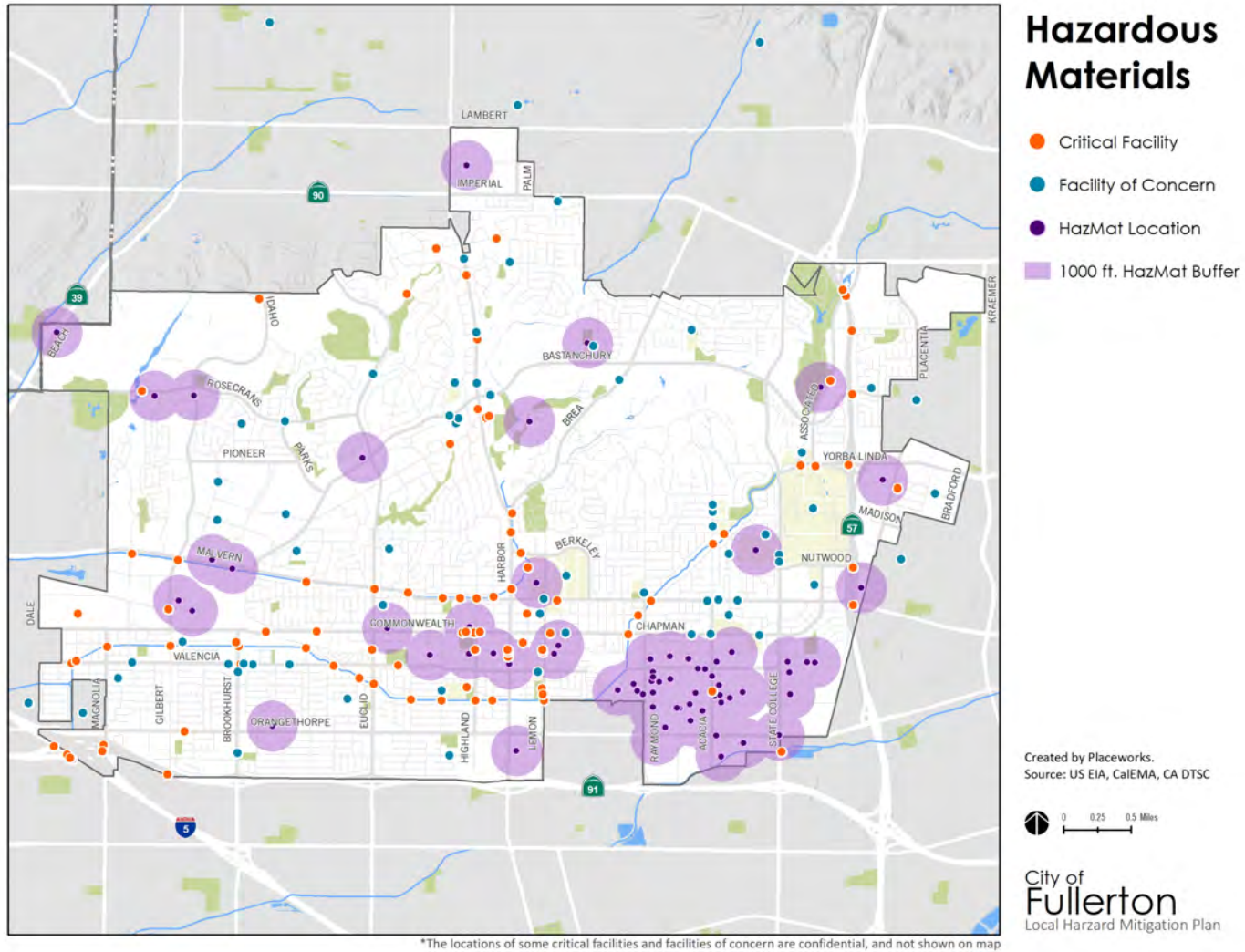
Hazardous materials, including chemicals used as byproducts of industrial activities, natural gas and oil pipeline ruptures could be a significant threat to human and environmental health if they are not properly stored, managed, and contained. Oil and natural gas lines could rupture, exposing flammable or toxic chemicals. A short section of the Crimson Pipeline carries crude oil cuts through the northeast corner of Fullerton. In addition, several oil pipelines carrying crude oil and refined product run through La Habra, Brea, Anaheim, and Buena Park. SoCalGas also runs a subterranean natural gas pipeline through the middle of the city that nearly divides northern and southern Fullerton in half. Although pipeline failures are low-frequency events, they can have disastrous consequences. Ruptures could lead to fires and explosions that cause serious injuries or fatalities as well as environmental contamination of waterways. Oil and gasoline could contaminate groundwater and lead to costly and multiyear cleanup efforts if released into waterways.

In addition, records from the Department of Toxic Substances Control have found harmful levels of toxic chemicals that have leached into the soil as a result of industrial activities. These chemicals can leach into the soil and potentially contaminate groundwater aquifers. **Figure 4-6** shows the critical facilities and facilities of concern that are nearby to hazardous materials sites in Fullerton.

Social Threat

The most concerning impact of hazardous chemicals and materials is their impact on human health. Hazardous chemicals used in oil and gas operations and hazardous materials used in other industrial operations could have harmful effects on certain groups, depending on how much and how long a person is exposed to them (ATSDR 2017). In particular, PCEs and TCEs could evaporate and expose persons occupying buildings located on the site to these compounds (ATSDR n.d.b). Crude oil pipelines can have high concentrations of hydrogen sulfide (H₂S), which is a poisonous and flammable gas that can cause death in low exposures (Butler et al. 2018). Children, adolescents, and pregnant women are especially at risk of health risks associated with these chemicals. The health risks include immune system diseases or pregnancy or birth complications (ATSDR n.d.b).

Figure 4-6: Critical Facilities and Facilities of Concern Near Hazardous Materials Sites in Fullerton



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HUMAN-CAUSED HAZARDS

Physical Threat

Organizations or agencies that protect important information, such as finance institutions, hospitals, government buildings, or universities, could be the target of cyber threats. A terrorist event could involve the intentional failure of dams, oil and gas pipelines, or other major infrastructure that would cause widespread destruction. The use of bioweapons, chemical agents, radioactive materials, or high-yield explosives could impact a community's water supply or overall exposure to hazardous materials. Civil disturbances could lead to large-scale damages to public or private property.

Social Threat

The human-caused hazards discussed above could threaten the lives of large numbers of people. Areas that draw large crowds, such as busy commercial areas, airports, or campuses, could be more at risk from a terrorist event or civil disturbance. Transportation accidents, such as aircraft failures, train, or truck accidents present a greater threat to people living in these areas and working in these industries. Additionally, civil disturbances, cyber threats, or terrorist events could be politically motivated and target specific populations. Therefore, sociopolitical, ethnic, or religious minorities could face a greater threat than the general population.

SEISMIC HAZARDS

Seismic hazards can cause widespread damage or destruction to buildings and other structures. All buildings in the community, including all critical facilities and facilities of concern, are threatened by earthquakes, although the threat varies depending on which fault line is responsible for the event. In general, facilities closest to the fault line face the highest threat. The fault line most likely to cause a significant earthquake in Fullerton is the Puente Hills fault, which runs through the southern half of the city.

A serious seismic event could slow economic activity and the provision of key services. Government administration nodes can be impaired if key facilities are damaged, and seismic damage to local hospitals could hinder medical care. A seismic event could potentially impact the electrical grid, potable water and sewage services, transportation networks, and communication services.

Liquefaction

Physical Threat

A significant section of the lower southwest section of the city would be affected by liquefaction, potentially impacting 109 key facilities. As shown in **Table 4-16**, a seismic event could cause liquefaction that damages bridges, education facilities, utility infrastructure, and several other critical facilities and facilities of concern. **Figure 4-7** maps the critical facilities and facilities of concern in Fullerton that are located within liquefaction hazard zones.

Social Threat

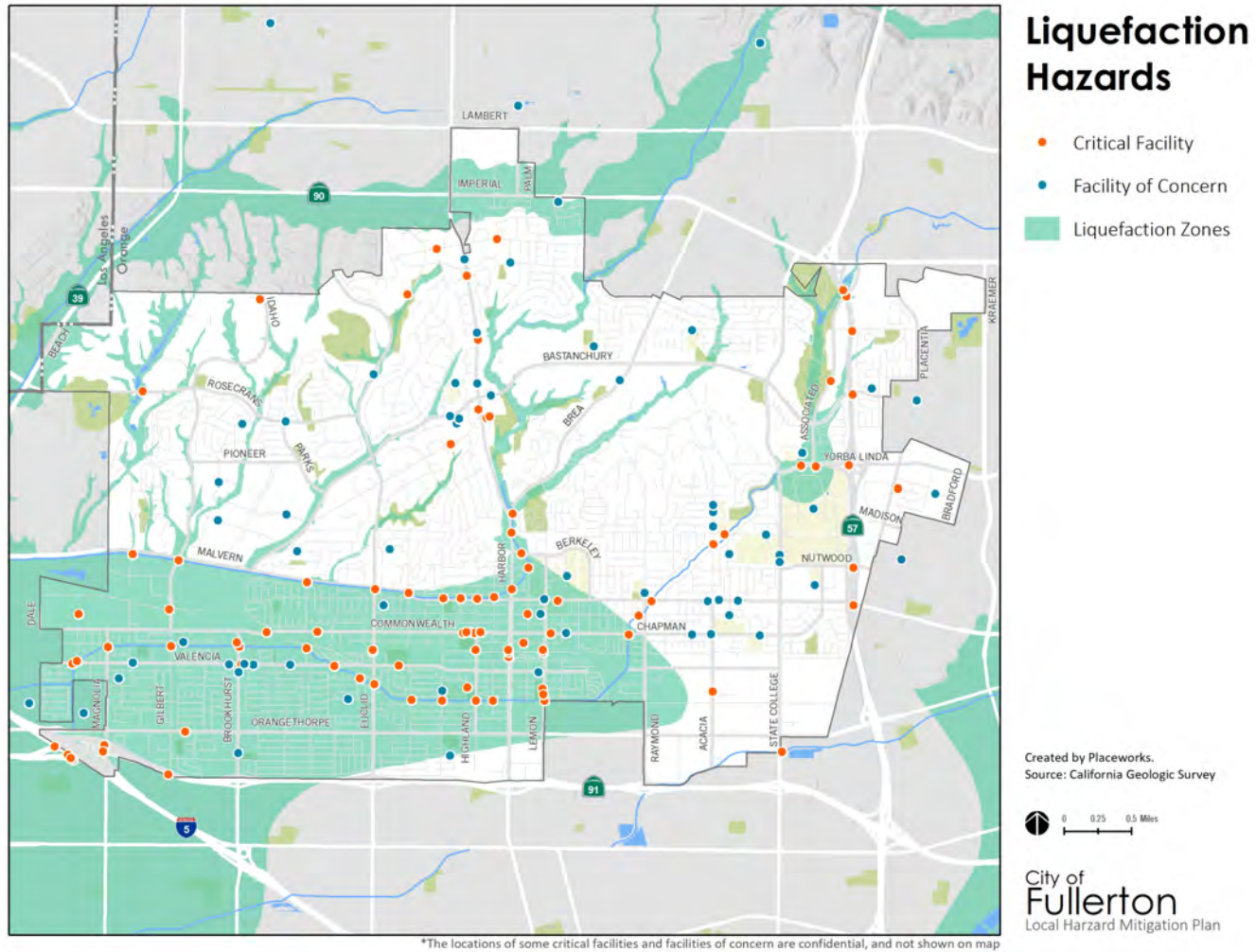
Liquefaction could affect 57,376 residents and 16,874 households, with more than half renting. Persons in the liquefaction hazard zone are slightly more likely to live under the poverty limit than the average

Fullerton resident, and households in the liquefaction hazard zone are also somewhat more likely to include a person with disabilities. **Table 4-17** shows the social vulnerability in the liquefaction hazard zone.

TABLE 4-16: KEY FACILITIES THREATENED BY LIQUEFACTION

Facility Type	Critical Facility	Facility of Concern	Total
Community Services	4	1	5
Education	0	14	14
Energy	2	0	2
Emergency Gathering Areas	3	0	3
Medical	0	7	7
Museum	1	0	1
Municipal Government	7	0	7
Transportation	54	0	54
Utility	1	0	1
Water and Sewage	15	0	15
Total	87	22	109

Figure 4-7: Critical Facilities and Facilities of Concern in Liquefaction Zones in Fullerton



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TABLE 4-17: FULLERTON THREATENED-POPULATION METRICS IN LIQUEFACTION ZONE

Vulnerable Population Metric	Liquefaction Zone	City of Fullerton
Population	57,376	139,044
Households	16,874	44,929
Median household income (adjusted to 2018 \$)	\$61,844	\$74,642
Renter Households	52%	46%
Percentage of households with at least one person living with a disability	22%	20%
Percentage of households living under poverty limit	16%	13%
Percentage of population aged 65+	10%	12%
Percentage of 65+ population living alone	20%	21%

Sources: ACS Estimates 2012-2016; ESRI 2018 Demographic and Income Profile.

SEISMIC SHAKING AND SURFACE FAULT RUPTURE

Physical Threat

All critical facilities and facilities of concern are threatened by seismic shaking, but structures that risk the most damage are those that are not seismically retrofitted or are built on unstable or water-saturated foundations. Seismic shaking can trigger other hazard events, including liquefaction, landslides, and subsidence.

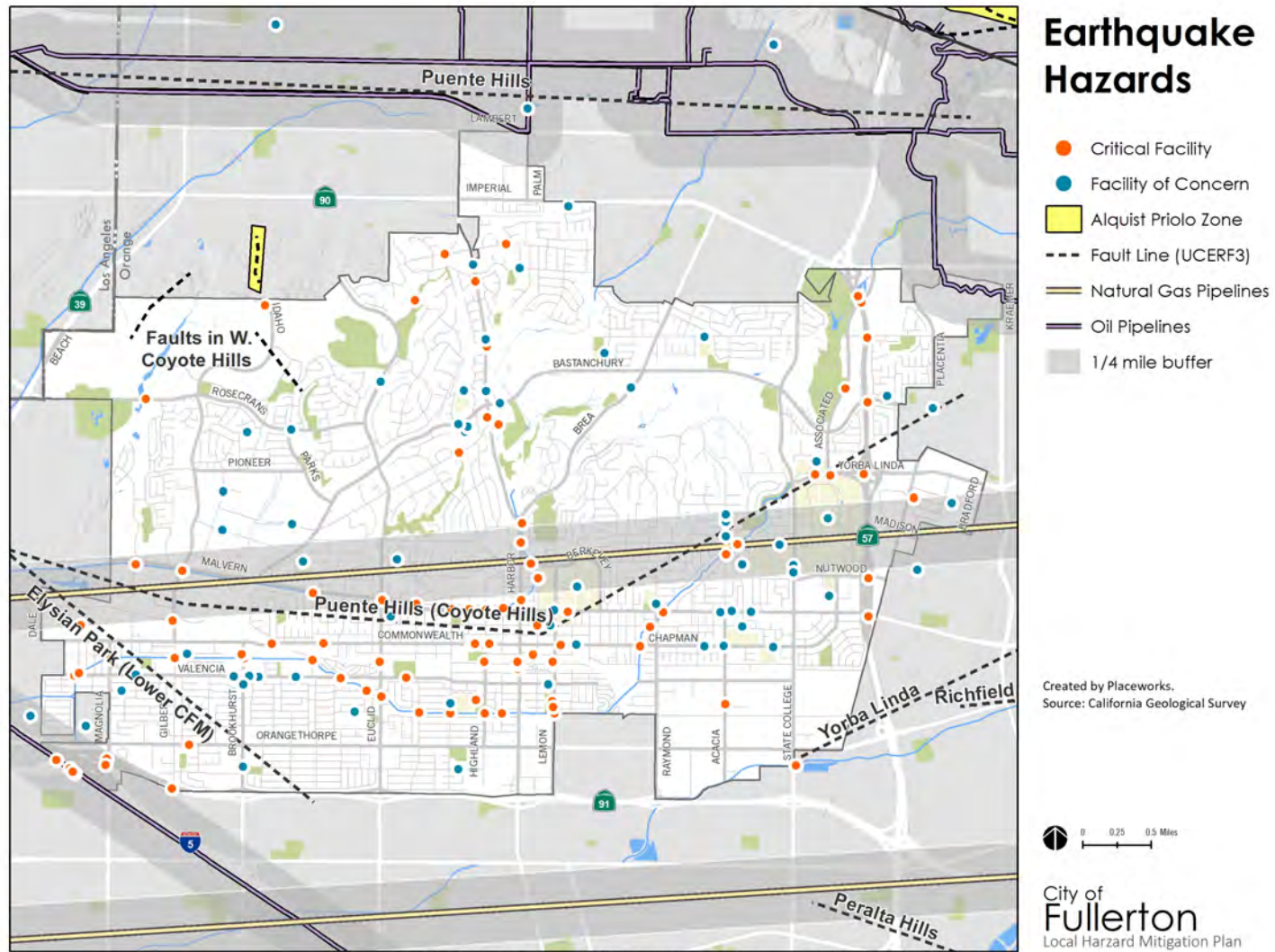
Surface fault rupture could damage any building or infrastructure within the rupture zone. The Puente Hills fault line in the southern section of the city threatens utility lines and other critical facilities. A fault rupture could burst the natural gas transmission line that runs near and crosses the Puente Hills fault line. Because natural gas is a flammable substance, a rupture can release natural gas into the air and ignite an explosion (IBHS 2018). **Figure 4-8** shows the critical facilities and facilities of concern in Fullerton that could be impacted by seismic shaking or fault rupture.

Social Threat

Seismic shaking and fault rupture pose a significant threat to populations living or working near structures that are not retrofitted to withstand seismic activity. This could include lower-income households who are unable to afford the cost of seismically retrofitting their homes or renters living in substandard housing. Senior citizens (especially those living alone) and lower-income households could have more difficulty recovering from a seismic event that causes significant damage to their home.

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Figure 4-8: Critical Facilities and Facilities of Concern in Seismic Shaking and Fault Rupture Zones in Fullerton



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SEVERE WEATHER

Physical Threat

Severe weather could affect all parts of Fullerton, so all critical facilities and facilities of concern are within this hazard zone. The two most common severe weather events that could affect Fullerton include high winds and extreme heat.

Severe Winds

Intense winds likely present the greatest threat to physical structures, particularly from trees or branches that fall on buildings and cause substantial damage. Older structures that have deferred maintenance or have not been retrofitted for high wind conditions may suffer greater damage in comparison to newer/updated structures. Utility lines and wooden utility poles face an elevated threat from wind, as do buildings without reinforced roofs.

Extreme Heat

Very high temperatures can cause roads to deform and buckle as concrete expands in the heat, especially in weaker spots in the pavement, such as areas that have not been maintained well. Power lines and other sections of the electrical grid are less effective in higher temperatures and may suffer damage due to stress during extreme heat events.

Buildings with dark pavement will absorb more heat than the surfaces with vegetation or lighter material, which are better at reflecting the sun's energy. This urban heat island effect is strongest during hot periods when the sun is strongest.

Heavy Rain

Heavy rain would damage any structures with poorly constructed roofs and could also erode the soil around building foundations. Heavy rain could also lead to flash flooding which would damage unelevated structures in flood zones. Heavy rains are most likely to cause damage to structures located on slopes, where the risk of erosion is the highest. Landslides triggered by heavy rains would damage any structures located below the landslide's starting point.

Tornado

Since tornadoes can occur anywhere in the city it is not possible to determine which structures would be impacted by a tornado event. However, any structures that have unsecured cladding or accessories (such as roof shingles, weather vanes, or radio antennas) are anticipated to experience some degree of damage. It is unlikely that any structure in Fullerton would be entirely demolished by a tornado event since tornadoes in California rarely reach that degree of destruction.

Social Threat

Severe Winds

Events such as severe winds and winter weather can harm people throughout Fullerton but have a greater effect on the safety of homeless persons and persons who work outdoors. Lower-income households, who may not be able to afford homes built or retrofitted to withstand powerful winds, could also have difficulty coping or recovering from heavy winds or storms.

Extreme Heat

Whereas a heat event can be relatively harmless for those with a reliable means for staying hydrated and cool, it can be deadly for others. Young children, the elderly, or people suffering from serious medical conditions are physiologically more vulnerable to heatstroke. Some senior citizens also take medicines that can make it harder for their bodies to maintain a safe internal temperature, creating an additional threat from extreme heat events. Young children may not be aware of the signs of dehydration or ways of protecting themselves from heatstroke.

People living in homelessness are at a high risk of health complications during heat waves, especially if they are unsheltered. According to data counts by the OC Health Care Agency, in 2017, there were approximately 4,800 individuals experiencing homelessness in the county, with over 50 percent unsheltered, approximately 25 percent in emergency shelters, and 20 percent in transitional shelters (OCGov 2017). During a heat wave, these people are very vulnerable to heatstroke, especially if they are unable to reach a cooling center.

Sudden spikes in heat can catch people by surprise. Stores can rapidly sell out of fans, air-conditioning units, or drinking water during a heat-wave. Lower-income households or those with limited mobility may be unable to acquire sufficient insulation or cooling devices without significant advance preparations.

Heavy Rain

Heavy rain events pose a threat to any groups in Fullerton who are not able to access adequate shelter. People who are homeless most often live in tents or informal structures that may protect against minor rains but are inadequate against a heavy rain event. Heavy rain can lead to flash flooding which could sweep away any informal dwellings located within drainages and stream courses. Additionally, vulnerable populations living in older homes that have outdated building materials may experience damage during significant rain events. If affected groups have limited incomes or lack the resources to make necessary repairs or maintain the structures, retrofit of these structures may be hindered.

Tornado

Tornadoes, like all severe weather events, pose a threat to those who lack adequate shelter. Any vulnerable populations that are unable to access shelter before a tornado event, are at risk of being injured or killed. In addition, populations living in older, unmaintained buildings are also likely to be at greater risk of impact from a tornado.

Other Threats

Debris from high winds and other severe weather events can block roadways, disrupting the local transportation network. This in turn can affect transit and emergency response personnel, who may be unable to reach certain areas of the community or may have to take alternative routes.

High temperatures can trap pollutants close to the ground and can potentially worsen air quality beyond what is acceptable under federal health standards.

CHAPTER 5

HAZARD MITIGATION STRATEGY

STRATEGY DEVELOPMENT PROCESS

Fullerton’s hazard mitigation strategy is a comprehensive set of actions—hazard mitigation actions—that are intended to reduce the impacts of hazard events. These actions will help to protect the safety and well-being of residents and visitors, critical facilities and facilities of concern, other buildings and structures, key services, the local economy, and other important community assets. Some actions will also help with emergency preparedness, enabling the community to more effectively respond to hazard events. Although preparedness actions are not a required component of an LHMP, the Hazard Mitigation Planning Committee chose to include them because they support a robust overall mitigation strategy.

USE OF HAZARD AND THREAT ASSESSMENT

The Committee relied in part on the hazard profiles and threat assessments in this Plan to develop the actions in the mitigation strategy. The Committee prepared a comprehensive set of mitigation actions that respond to the relevant hazard situations and provide protection to residents, businesses, and community assets in Fullerton. The Committee took care to ensure that the mitigation actions will help to reduce damage from the most frequent types of hazard events, the most significant that may reasonably occur, and those with the greatest potential to harm the community. The Committee also drafted mitigation actions that will help protect the most vulnerable members of the community and the most vulnerable local assets.

CAPABILITIES ASSESSMENT

The capabilities assessment is a review of the existing local agencies, public policies, funding sources, individuals, and other resources that can support hazard mitigation activities in Fullerton. The hazard mitigation actions build off of the existing success of these resources and leverage their capabilities to support improved resiliency in the community. The capabilities assessment looked at the following types of resources:

- Personnel resources: City staff and volunteers, and staff and volunteers at other agencies.
- Plan resource: Advisory or enforceable plans adopted by the City or other agencies.
- Policy resource: Policies adopted and implemented by the City or other agencies.
- Technical resource: Data and tools available to the City.

Table 5-1 shows the capabilities assessment for Fullerton. A key addition to this table is the identification of plan integration activities from the previous LHMP. These activities have been highlighted within the capabilities assessment table as “Plan Integration Components”.

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TABLE 5-1: CAPABILITIES ASSESSMENT

Resource Name	Type of Resource	Ability to Support Mitigation	Website
City of Fullerton			
Building Code	Policy resource	The Fullerton Building Code and associated standards (Residential Code, Mechanical Code, Electrical Code, etc.) are a set of regulations that govern how new buildings are constructed. These standards are published by the state and are adopted by local communities, sometimes with amendments to make the codes more locally applicable. Mitigation actions to construct buildings to a safer standard, allowing them to better resist damage during a hazard event, may be made part of future building code updates.	https://www.cityoffullerton.com/gov/departments/dev_serv/building_n_permits/default.asp
Capital Improvement Plan	Plan resource	The Fullerton Capital Improvement Plan is a set of construction projects planned for City-owned buildings, facilities, and infrastructure. It is updated every year as part of the City's annual budget and includes projects for the next 5 years. Mitigation actions to retrofit existing City-owned structures or to build new ones that are better able to resist damage may be implemented by including these projects in the Capital Improvement Plan in the future.	https://www.cityoffullerton.com/gov/departments/public_works/capital_improvements_programs/capital_improvement_program_overview.asp
	Plan Integration Component	Several mitigation actions from the previous LHMP were integrated into major capital improvement projects that were completed or in progress by the City since previous adoption.	
Community Development Department	Personnel resource	The Fullerton Community Development Department consists of the Building Division, Code Enforcement Division, Housing and Neighborhood Services, and Planning Division. The department is responsible for approving building permits, ensuring that buildings and private property comply with appropriate standards, conducting short-term and long-term planning activities in the community, and coordinating activities that preserve and enhance the character of Fullerton's neighborhoods. As part of these duties, the department enforces the Fullerton Building Code and all land use regulations. Mitigation actions related to the construction of new structures or retrofits or improvements to existing structures may be implemented through future plan processing by Community Development Department staff. Currently, the Hazard Mitigation Planning Committee leader for Fullerton is in the Community Development Department and is responsible for coordinating updates to the City's LHMP.	https://www.cityoffullerton.com/gov/departments/dev_serv/default.asp
Community Emergency Response Team	Personnel resource	The Fullerton Community Emergency Response Team (CERT) is a group of volunteers trained in disaster preparedness, public safety, traffic control, and emergency response. CERT members can conduct disaster preparedness activities as well as light emergency response activities when disaster situations occur. The program is managed by the Fullerton Fire Department. Mitigation actions related to community training and education may be further implemented through expansion or revisions to the CERT program.	https://www.cityoffullerton.com/gov/departments/fire/emergency_preparedness/cert/default.asp

TABLE 5-1: CAPABILITIES ASSESSMENT

Resource Name	Type of Resource	Ability to Support Mitigation	Website
Emergency Operations Plan	Plan Resource	The Fullerton Emergency Operations Plan is a comprehensive document that provides direction and guidance to City Departments and personnel during an emergency situation.	N/A
	Plan Integration Component	Incorporation of information from the LHMP informed the relocation of the City’s Emergency Operations Center.	
Fire Department	Personnel resource	The Fullerton Fire Department provides 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.	https://www.cityoffullerton.com/gov/departments/fire/about_fire_department/default.asp
General Plan	Plan resource	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.	https://www.cityoffullerton.com/gov/departments/dev_serv/general_plan_update/default.asp
	Plan Integration Component	Upon adoption of the previous LHMP, the City integrated the document into the General Plan to ensure compliance with AB 2140.	
Human Resources Department	Personnel resource	The Fullerton 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.	https://www.cityoffullerton.com/gov/departments/hr/default.asp
Landscape Maintenance Division	Personnel resource	The Fullerton Landscape Maintenance Division, part of the Public Works Department, is responsible for maintaining the City’s parks, reservoir basins, hiking trails, and other City properties. It manages tree trimming and the preparation of Fullerton’s Community Forest Management Plan. Mitigation actions that involve responding to tree mortality, drought resilience of public landscapes, and pest management fall under the purview of the Landscape Maintenance Division.	https://www.cityoffullerton.com/gov/departments/public_works/landscape/default.asp
Parks and Recreation Department	Personnel resource	The Fullerton Department of Parks and Recreation is responsible for neighborhood centers, parks, trails, and museums and managing classes and special events offered to the community. The Parks and Recreation Commission studies policy recommendations related to parks and recreation concerns, projects, and programs. This Department also provides programs and services for Fullerton’s senior population and connects seniors with transportation vouchers and bus passes. Mitigation actions involving community outreach and designations of Parks and Recreation facilities as emergency shelters may be implemented by this department.	https://www.cityoffullerton.com/gov/departments/parks_n_recreation/default.asp

TABLE 5-1: CAPABILITIES ASSESSMENT

Resource Name	Type of Resource	Ability to Support Mitigation	Website
City Manager's Office	Personnel Resource	The Fullerton City Manager Department has executive oversight of citywide operations, policy development, and fiscal planning and manages economic development, public information, city clerk, and city council services. The department also holds the Economic Development, City Clerk's Office, and the Public Information Office. The Public Information Office coordinates all external communication between the City and citizens, including news releases, social media, and general information management.	https://www.cityoffullerton.com/gov/departments/city_manager/default.asp
Police Department	Personnel resource	The Fullerton Police Department is charged with maintaining public safety in the community. As part of this work, the police department is responsible for conducting emergency preparedness activities, investigating criminal activity, and directing traffic. Mitigation actions that relate to the safe movement of traffic (e.g., during evacuations), the public safety of residents during emergency events, and terrorism-related activities may be implemented through police department staff. Because emergency preparedness is part of the department's responsibilities, the police department can also widely implement other types of mitigation actions through coordination with other departments and agencies.	http://www.fullertonpd.org/
Public Information Office	Personnel resource	The Fullerton Public Information Office, a part of the City Manager's Office, is responsible for disseminating critical information to the public in a timely manner. The Office writes and publishes press releases, manages the City's social media outlets, and distributes general information.	https://www.cityoffullerton.com/gov/departments/city_manager/public_information/default.asp
Public Works Department	Personnel resource	The Fullerton Public Works Department is responsible for constructing and maintaining City-owned facilities and infrastructure, including roadways, sidewalks, parks, and open space areas. Mitigation actions that involve constructing or retrofitting City-owned facilities and infrastructure may be implemented through Public Works Department staff.	https://www.cityoffullerton.com/gov/departments/public_works/divisions.asp
Water Division	Technical resource	The Fullerton Water Division, part of the Department of Public Works, is a municipally owned water supplier. The Division's responsibilities also include building and maintaining the local water infrastructure, ensuring water quality, and conducting water conservation programs. Mitigation measures related to water use and water supply may be implemented in collaboration with City staff.	https://www.cityoffullerton.com/gov/departments/public_works/water_system/default.asp
Orange County			
Orange County Fire Authority	Personnel resource	The Orange County Fire Authority (OCFA) provides fire protection and firefighting services to the unincorporated areas of Orange County and many incorporated communities. Fire-related mitigation actions that require coordination with the county may be implemented in collaboration with OCFA staff.	http://ocfa.org/

TABLE 5-1: CAPABILITIES ASSESSMENT

Resource Name	Type of Resource	Ability to Support Mitigation	Website
Orange County Hazard Mitigation Plan	Plan resource	The Orange County Hazard Mitigation Plan identifies and describes the hazard events that may occur in the unincorporated areas of Orange County and provides a suite of mitigation actions to help decrease the potential damage from these hazards. Mitigation actions for Fullerton that require coordination with the county may be integrated into the County’s Hazard Mitigation Plan. Similar mitigation actions in both the county’s and Fullerton’s hazard mitigation plans can lead to a more regionally unified hazard mitigation strategy, which may improve effectiveness.	http://www.ocgov.com/civica/inc/blobfetch.aspx?BlobID=47524
Orange County Water District	Personnel resource	The Orange County Water District (OCWD) is the agency responsible for managing groundwater supplies in Orange County, which is a source of some of the water supply for Fullerton. Mitigation actions related to groundwater supplies, including groundwater recharge, may be implemented with support and assistance from OCWD.	https://www.ocwd.com/
Orange County Sanitation District	Personnel resource	The Orange County Sanitation District (OCS D) is the local wastewater utility that collects sewage water from Fullerton and other municipalities in Orange County. OCS D also operates a water reclamation plant that supports tertiary water treatment. Mitigation actions pertaining to water infrastructure, supply, and treatment may be implemented through OCS D.	https://www.ocsd.com/
Orange County Health Care Agency	Personnel resource	The Orange County Health Care Agency is a regional provider that provides and regulates certain health services, such as food protection, hazardous waste regulation, coastal water quality monitoring, and pollution prevention. Mitigation actions related to the agency’s environmental health and food safety and public health service areas would require coordination with the OC Health Care Agency.	http://www.ochealthinfo.com/
Regional, State, and Federal Agencies			
Cal-Adapt	Technical resource	Cal-Adapt is an online tool that provides detailed projections for future climate-related conditions in California, including factors such as temperature, precipitation, and sea level rise. These projections can help inform forecasts of future hazard events and can explain how hazard conditions are expected to change. The Committee can use Cal-Adapt to monitor anticipated changes in future climate conditions and adjust mitigation actions accordingly.	http://cal-adapt.org/
California Department of Transportation	Technical resource	The California Department of Transportation (Caltrans) is the state agency with jurisdiction over designated highways, including the Orange Freeway (State Route 57) and the Riverside Freeway (State Route 91). Mitigation measures related to ensuring the resiliency of state-designated freeways may utilize the agency’s data and be implemented in coordination with Caltrans.	http://www.dot.ca.gov/
California Governor’s Office of Emergency Services	Technical resource	The California Governor’s Office of Emergency Services (Cal OES) is the state agency responsible for reducing hazards in the state through mitigation activities, conducting emergency planning, supporting emergency response and recovery activities, and acting as a liaison between local and federal agencies on emergency-related issues. It provides guidance on hazard mitigation planning activities, shares best practices, and distributes funding opportunities. The Committee can work with Cal OES to obtain funding to implement LHMP mitigation strategies and to receive guidance on future updates.	http://www.caloes.ca.gov/

TABLE 5-1: CAPABILITIES ASSESSMENT

Resource Name	Type of Resource	Ability to Support Mitigation	Website
California State Hazard Mitigation Plan	Plan resource	The California State Hazard Mitigation Plan assesses the types of hazards that may be present in California. It includes descriptions of these hazards, summaries of past hazard events, descriptions of how these hazards may occur in the future, and how these hazards may harm the people and assets of California. Like a local hazard mitigation plan, the State Hazard Mitigation Plan is updated every five years. The Committee can use the State Hazard Mitigation Plan as a source of information to refine the hazard profiles and vulnerability assessments in future Fullerton LHMPs.	http://www.caloes.ca.gov/for-individuals-families/hazard-mitigation-planning/state-hazard-mitigation-plan
Federal Emergency Management Agency	Technical resource	The Federal Emergency Management Agency (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 grant programs.	https://www.fema.gov/
Metropolitan Water District of Southern California	Technical resource	The Metropolitan Water District of Southern California (MWD) is a public agency that supplies water to various water providers throughout the southern California region, many of whom in turn distribute the water to more localized water suppliers. Water used in Fullerton that comes from outside Orange County is supplied by MWD. Mitigation actions that involve local water supplies may be implemented through coordination with MWD. The agency may also provide technical support and other resources for mitigation actions involving water use.	http://www.mwdh2o.com/
Army Corps of Engineers, Los Angeles District	Technical resource	The United States Army Corps of Engineers designed, built, and manages the flood control infrastructure in and around Fullerton. They are responsible for evaluating the conditions of the dams that keep floodwaters from inundating the City and the surrounding communities. Mitigation actions involving dam failure, flooding, and severe weather may be supported by the Army Corps of Engineers.	https://www.spl.usace.army.mil/
Private agencies			
Southern California Edison	Technical resource	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.	https://www.sce.com/
Southern California Gas Company	Technical resource	The 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.	https://www.socalgas.com/

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EVALUATION OF POTENTIAL HAZARD MITIGATION ACTIONS

Based on the hazard profiles, threat assessment, capabilities assessment, results of the community survey, discussions among Committee members, and existing best practices, the Committee prepared a set of potential mitigation actions. The Committee evaluated these potential actions using the criteria described in the following paragraphs and **Table 5-2**.

FEMA requires local governments to evaluate the monetary and nonmonetary costs and benefits of potential mitigation actions. Although local governments are not required to assign specific dollar values to each action, they should identify the general size of costs and benefits. The Committee may elect to include measures that have a high cost or low benefits, but such measures should be clearly beneficial to the community and an appropriate use of local resources.

In addition, FEMA directs local governments to consider the following questions as part of the financial analysis:

- What is the frequency and severity of the hazard type to be addressed by the action, and how vulnerable is the community to this hazard?
- What impacts of the hazard will the action reduce or avoid?
- What benefits will the action provide to the community?
- What critical facilities, if any, will benefit from the action? How many facilities will benefit, and how important are they to the community?
- What are the environmental benefits or impacts of the action?

The Committee reviewed and revised the potential hazard mitigation actions according to the following set of criteria, known as STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) to guide and inform discussions. **Table 5-2** shows the STAPLE/E criteria.

TABLE 5-2: STAPLE/E CRITERIA

Issue	Criteria
Social	<ul style="list-style-type: none"> • Is the action socially acceptable to Fullerton community members? • Would the action treat some individuals unfairly or inequitably? • Is there a reasonable chance of the action causing a social disruption?
Technical	<ul style="list-style-type: none"> • Is the action likely to reduce the risk of the hazard occurring, or will it reduce the effects of the hazard? • Will the action create new hazards, or make existing hazards worse? • Is the action the most useful approach for Fullerton to take, given the goals of the City and of community members?
Administrative	<ul style="list-style-type: none"> • Does the City have the administrative capabilities to implement the action? • Are there existing City staff who can lead and coordinate implementation of the measure, or can the City reasonably hire new staff for this role? • Does the City have enough staff, funding, technical support, and other resources to carry out implementation? • Are there administrative barriers to implementing the action?
Political	<ul style="list-style-type: none"> • Is the action politically acceptable to City officials and to other relevant jurisdictions and political entities? • Do community members support the action?
Legal	<ul style="list-style-type: none"> • Does the City have the legal authority to implement and enforce the action? • Are there potential legal barriers or consequences that could hinder or prevent implementation of the action? • Is there a reasonable chance that implementation of the action would expose the City to legal liabilities? • Could the action reasonably face other legal challenges?
Economic	<ul style="list-style-type: none"> • What are the monetary costs of the action, and do the costs exceed the monetary benefits? • What are the start-up and maintenance costs of the action, including administrative costs? • Has funding for action implementation been secured, or is a potential funding source available? • How will funding the action affect the City's financial capabilities? • Could implementation of the action reasonably burden the Fullerton economy or tax base? • Could there reasonably be other budgetary and revenue impacts to the City?
Environmental	<ul style="list-style-type: none"> • What are the potential environmental impacts of the action? • Will the action require environmental regulatory approvals? • Will the action comply with all applicable federal, state, regional, and local environmental regulations? • Will the action reasonably affect any endangered, threatened, or otherwise sensitive species of concern?

PRIORITIZATION

As part of the effort to review the hazard mitigation actions, the Committee also prioritized the actions. They looked at the risks and threats from each hazard, financial costs and benefits, technical feasibility, and community values, among others. Committee members were asked to identify their priority actions through a vote. Items prioritized by at least four Committee members are considered high priority, and those prioritized by one to three members are considered medium priority. Actions not prioritized by any Committee member are considered low priority.

COST ESTIMATES

To meet the cost estimation requirements of the hazard mitigation planning process, the Committee identified relative cost estimates based on their understanding of the mitigation action intent and their experience developing identical or similar programs/implementing projects. Three cost categories based on the City’s typical cost criteria were used for budgeting purposes:

- Low cost (\$): \$25,000 or less
- Medium cost (\$\$): \$25,001 to \$500,000
- High cost (\$\$\$): Greater than \$500,000

HAZARD MITIGATION ACTIONS

PROGRESS ON PRIOR MITIGATION ACTIONS

In 2010, the City of Fullerton adopted its most recent Local Hazard Mitigation Plan, which this Plan replaces. The 2010 Plan identified numerous mitigation actions and strategies to address the hazards that threaten Fullerton. Table 5-3A identifies the status of previous mitigation actions, some of which, have been incorporated into this LHMP, completed, or abandoned. For example, the 2010 Plan called for Fullerton to integrate the LHMP into the safety element of Fullerton’s General Plan—this was completed in 2012 with the adoption of a comprehensive update to the General Plan. The Plan also recommended the grade separation of State College Blvd, Raymond Ave, and Acacia Ave. At the time of this Plan’s composition, the grade separation of State College Blvd and Raymond Ave have been realized. The Plan also suggested that the City’s GIS staff map all of Fullerton’s cultural and historic assets. This task was completed and incorporated into the City’s 2012 General Plan update.

Some mitigation actions are still pending completion at the time of this Plan’s writing. The 2010 Plan called for the update of the Community Forest Master Plan, a mitigation action which will be continued into this LHMP. The Plan also identified the stabilization of the slope abutting Harbor Blvd as a mitigation action, but funding for that project is still pending. Other projects are still in the implementation process. Improvements to the Olive Street Storm Drain system were completed in 2017 by the City’s Engineering Division, but the second phase of the project is not scheduled to begin until 2020. Ultimately, the mitigation actions provided in Table 5-3B incorporate relevant mitigation actions from the 2010 plan that were not completed. In some cases, these actions were modified to ensure relevancy to the updated goals, analysis, and results of this planning process.

TABLE 5-3A: PREVIOUS MITIGATION ACTIONS

Mitigation Action Title	Status Update (Completed, Abandoned, Continue into New LHMP)
Multi-Hazard	
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Completed
Tree Master Plan Update	Continue into New LHMP (Integrated into Action P.2)
Community Forest Master Plan Update	Continue into New LHMP (Action P.2)

Develop and Conduct a Multi- Hazard Seasonal Public Awareness Program	Continue into New LHMP (Action P.6)
Hazardous Materials GIS improvements	Continue into New LHMP (Action 8.2)
Acacia Grade Separation	Abandoned
State College Grade Separation	Completed
Raymond Grade Separation	Completed
Data Gathering and GIS Tracking of Police and Fire Calls for Service in Response to Natural Hazard Events	Abandoned
GIS Integration	Continue into New LHMP (Action P.11)
GIS tracking of Historic, Cultural, and Natural Resources	Abandoned
Water Master Plan	Abandoned
Multi-hazard: flood, liquefaction	
Structure Buy Out Program and Conversion (Southwest Fullerton) to Open Space	Abandoned
Dam Failure	
Brea Dam Safety and Maintenance Plan	Abandoned
Drought	
Convert Lions Field/Richmond Park to Artificial Turf	Completed (Lions Field) / Abandoned (Richmond Park)
Water Main Replacement	Continue into New LHMP (Actions 1.2, 1.6, 1.7)
Water Allocation Study	Abandoned
Water Meter Replacement with AMI	Continue into New LHMP (Action 4.1)
Park and Recreation Master Plan	Abandoned
Drought and Earthquake	
Reservoir Rehabilitation	Continue into New LHMP (Actions 1.2, 1.6, 1.7)
New Well 7A	Continue into New LHMP (Actions 1.2, 1.6, 1.7)
Booster Station Rehabilitation	Continue into New LHMP (Actions 1.2, 1.6, 1.7)
Earthquake	
Seismic Compliance/Retro Fit for Existing Structures – Public and Critical Facilities	Completed (Bridge Preventive Maintenance Plan updated in 2018.)
Seismic Compliance/Retro Fit for Existing Structures – Private	Continue into New LHMP (Actions 10.2, 10.4, 10.6)
Earthquake /Erosion/Flood	
Harbor Slope Stabilization	Continue into New LHMP (Actions 7.1, 7.3)
Erosion/Flood	
Bastanchury Storm Drain Improvements	Continue into New LHMP (Actions 6.1, 6.3)
Flood	
Olive Street Storm Drain Improvements	Phase I Completed/ Phase II slated for summer 2020.
Evaluate status of floodplain management program	Continue into New LHMP (Actions 6.5, 6.6)
Wildfire	
Modifying/Enforcing Fuels Modification Plans and Weed Abatement on Public Lands	Continue into New LHMP (Actions 5.1, 5.2, 5.7)
Study for Protection of Existing EOC (Fire Station 6)	Completed
Purchase Type 3 Engine	Continue into New LHMP (Action 5.3)

HAZARD MITIGATION GOALS

The goals identified in **Chapter 1** help develop policies to protect community members, ecosystems, and other important assets from hazard events. These goals were developed to ensure consistency with the City's General Plan Safety Element ⁴, which will be updated as part of this process. These goals informed the development of mitigation actions and act as checkpoints to help City staff determine the progress of mitigation action implementation.

- Reduce and isolate threats to public safety and property in Fullerton.
- Maintain government operations and provisions of essential services to residents and stakeholders during and after a hazard event.
- Protect the natural environment through responsible stewardship of air, water, and open spaces in Fullerton.
- Promote resiliency and climate action in Fullerton through resilient infrastructure, responsive governance, and vibrant civic participation.
- Partner with surrounding local, regional, state, and federal jurisdictions in hazard mitigation efforts.

Based on the criteria and evaluation processes used during Plan development, the Committee prepared a prioritized list of mitigation actions to improve Fullerton's resiliency to hazard events. Collectively, these comprise the community hazard mitigation strategy. **Table 5-3** lists the mitigation actions as well as the prioritization of each action and other details related to implementation. Priorities identified are intended to assist the City in future funding and implementation activities.

⁴ The comprehensive update to the Fullerton General Plan is called The Fullerton Plan. The Safety Element is divided into two chapters of The Fullerton Plan, Natural Hazards and Public Safety.

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
Preparedness Activities						
P.1	Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Fullerton Public Library, and any others that the City may so designate in the future.	General Fund, Grants	Public Works	Low	2022	High (5)
P.2	Update the Community Forest Master Plan, incorporating drought strategies and wildfire vulnerabilities into the planning framework.	General Fund, Grants	Public Works (Landscape Maintenance Division)	Low	2022	Medium (3)
P.3	Hire a full-time Emergency Operations Coordinator for Fullerton.	General Fund, Grants	City Manager, Human Resources	High	2022	Medium (1)
P.4	Continuously research, prepare, and submit applications for hazard mitigation grants.	General Fund, Grants	All	Low	Ongoing	Low (0)
P.5	Update Safety Element to incorporate the 2019 Local Hazard Mitigation Plan.	General Fund, Grants	Community Development	Low	2020	Low (0)
P.6	Develop a communications plan and protocol to immediately disseminate information about potential hazard conditions to all City staff and to residents and businesses in potentially affected areas (alert homeowners in wildfire hazard zones if high fire conditions occur, warn property owners in 100-year floodplain if heavy rainfall is expected, etc.).	General Fund, Grants	Public Works, City Manager, Fire	Low	TBD	Low (0)
P.7	Promote and assist business owners in Fullerton to develop and regularly update an emergency preparedness plan and expand the existing Alert OC system.	General Fund, Grants	Fire	Low	Ongoing	Low (0)
P.8	Organize frequent workshops on emergency preparedness topics (e.g., essential items for emergency kits, evacuation routes, landscaping to reduce runoff and fire risk) for residents and business owners.	General Fund, Grants	Fire	Low	Ongoing	Low (0)
P.9	Conduct interjurisdictional trainings with partner first-responder agencies in the area, including CAL FIRE, OCFA, Orange County Sheriff’s Department, CSUF University Police, police and fire departments of adjacent cities, and any other agencies that Fullerton may select in the future.	General Fund, Grants	Fire, Police	Low	Ongoing	Low (0)

⁵ Some mitigation actions were subsequently added to this table after the HMPC had conducted the ranking and prioritization exercise. Such actions were not able to be voted upon the HMPC members and are thus denoted with the text “Not voted upon” in the “Priority” column.

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
P.10	Develop smart transportation demand management systems to respond to increased volumes of traffic during an evacuation.	General Fund, Grants	Public Works, Engineering	Medium	2021	Low (0)
P.11	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.	General Fund, Grants	Community Development, Public Works	Medium	2021	Low (0)
P.12	Develop partnership with wireless telephone companies to ensure that they maintain phone towers and communication facilities during emergency situations.	General Fund, Grants	City Manager, Fire	Low	TBD	Low (0)
P.13	Coordinate with major employment centers to ensure that adequate evacuation planning is conducted, and infrastructure used for evacuation purposes (roads, bridges, sidewalks) are kept clear and in good repair to ensure accessibility for pedestrians and motorists.	General Fund, Grants	Community Development, Public Works	Medium	Ongoing	Not voted upon.
Multiple hazards⁶						
1.1	Install backup generators at key critical facilities (City Hall, Fire Stations, Police Stations, water pumps, etc.) in the event of power loss during an emergency. Install portable generators in City-owned water facilities. <i>(Hazards addressed: All)</i>	General Fund, Grants	Public Works	High	2021	High (5)
1.2	Frequently reassess the areas where critical facilities and areas of elevated hazard risk intersect. <i>(Hazards addressed: Dam failure, fire, flood, landslide, subsidence, hazardous materials release, seismic shaking, liquefaction, fault rupture).</i>	General Fund, Grants	All	Low	Ongoing	Low (0)
1.3	Encourage SoCalGas, Southern California Edison, Orange County Sanitation District, Metropolitan Water District of Orange County, and Orange County Water District to harden their infrastructure in the city to reduce the risk of breach. <i>(Hazards addressed: Dam failure, fire, flood, hazardous materials release, transportation accidents, terrorism)</i>	General Fund, Grants	City Manager and City Council	Low	Ongoing	Low (0)
1.4	Plant fire-resistant, drought-tolerant groundcover on slopes, inclines, and hillsides to reduce runoff and erosion during heavy rainfall. <i>(Hazards addressed: Drought, fire, flood, geologic)</i>	General Fund, Grants	Public Works, Community Development	Medium	Ongoing	Low (0)

⁶ Some of the mitigation actions in the Multiple Hazards section address a combination of different hazards or they may address all of them. This is noted in the “Hazards Addressed” note after each mitigation action.

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
1.5	Inform residents in areas of elevated hazard risk of the risks and proper preparation techniques and evacuation procedures. <i>(Hazards addressed: All)</i>	General Fund, Grants	City Manager, Administrative Services, Police, Fire	Medium	Ongoing	Low (0)
1.6	Position new critical facilities outside of elevated hazard risk areas and relocate existing critical facilities outside of hazard risk areas, as feasible. <i>(Hazards addressed: Dam failure, drought, fire, flood, geologic, and seismic)</i>	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)
1.7	Address structural or operational weaknesses in bridges, dams, retaining walls, etc. to reduce risk of failure during a hazard. <i>(Hazards addressed: All)</i>	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)
Dam Failure						
2.1	Coordinate with state and federal agencies to collectively identify threats to the City and the region and identify ways to retrofit/strengthen the dams under their control.	General Fund, Grants	Public Works, Parks and Recreation, City Manager	Low	Ongoing	Low (0)
2.2	Investigate the feasibility of an early warning alarm to be activated in the parts of Fullerton within a particular dam failure inundation area should the reservoir(s) breach.	General Fund, Grants	Public Works, City Manager	Medium	2020	Low (0)
Disease and pest management						
3.1	Coordinate with surrounding jurisdictions, local health care providers, businesses, schools, the Orange County Health Care Agency, the California Department of Public Health, and the Centers for Disease Control 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.	General Fund, Grants	City Manager, Fire	Low	Ongoing	Low (0)
3.2	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.	General Fund, Grants	City Manager	Low	Ongoing	Low (0)
3.3	Continue to work with residents, business owners, and utilities to remove dead, dying, and diseased trees weakened by disease/pests.	General Fund, Grants	Public Works, Community Development	Medium	Ongoing	Low (0)

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
Drought						
4.1	Launch a pilot program with smart water meters to track water usage in commercial and industrial properties across the City.	General Fund, Grants	Public Works	High	2022	Medium (2)
4.2	Perform pilot study to predict water main breaks around Fullerton.	General Fund, Grants	Public Works	Medium	2022	Low (0)
4.3	Identify opportunities (grant funding, design assistance, etc.) to sponsor homeowner retrofits from lawns to low-water-consuming plants.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
Fire						
5.1	Remove highly flammable vegetation in Very High, High, and Moderate Fire Hazard Severity Zones and replant with fire-adapted specimens.	General Fund, Grants	Public Works	Medium	Ongoing	High (5)
5.2	Create a hillside weed abatement pilot program using goats or other livestock to reduce fuel loads in fire-prone areas.	General Fund, Grants	Fire	Medium	2021	High (4)
5.3	Obtain a Type 3 Fire Engine to respond to potential fire threats in the fire-prone areas of the City.	General Fund, Grants	Fire	High	2021	Medium (2)
5.4	Draft and adopt a Community Wildfire Preparedness Plan for areas within the Very High, High, and Moderate Fire Hazard Severity Zones.	General Fund, Grants	Fire	Medium	2023	Medium (1)
5.5	Create a rapid response plan from among Fullerton's and Orange County's first responders to secure hospital, nursing and assisted living facilities, as many of them are located within fire hazard severity zones.	General Fund, Grants	Fire	Low	2022	Medium (1)
5.6	Reinforce and regularly inspect fire retardant infrastructure such as sprinklers, fire hose terminals, and fire suppression systems in City facilities.	General Fund, Grants	Fire, Public Works	High	Ongoing	Low (0)
5.7	Clear dead vegetation in reservoir footprints, railroad rights-of-way, parks, and open spaces, especially during and after a drought episode.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
5.8	Develop a model to evaluate the water system to ensure it meets fire flow requirements throughout wildfire hazard zone areas.	General Fund, Grants	Public Works	Medium	2022	Low (0)

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
5.9	Continue fire hazard prevention awareness campaign to residents in the High and Very High Fire Hazard Severity Zones.	General Fund, Grants	Fire	Medium	Ongoing	Low (0)
5.10	Expand the existing home preparedness assessment program to assist more residents in understanding and addressing their wildfire risk.	General Fund, Grants	Fire	Medium	2020	Low (0)
5.11	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.	General Fund, Grants	Community Development, Fire	Low	2025	Low (0)
Flood						
6.1	Draft an ecosystem restoration plan and upgrade of drainage systems in Gilman Park and other similar areas in Fullerton.	General Fund, Grants	Public Works	High	2022	Medium (3)
6.2	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.	General Fund, Grants	Public Works	High	2020	Medium (1)
6.3	Update the City's Drainage Area Master Plan on a regular basis to incorporate new data and/or address emerging issues.	General Fund, Grants	Public Works	High	Ongoing	Medium (1)
6.4	Keep all 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.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
6.5	Continually update the mapped boundaries of floodplain inundation zones within the City.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
6.6	Continuously pursue FEMA elevation certification for all structures in Fullerton.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
6.7	Elevate and flood-proof public utility boxes above expected flood depth elevation in flood hazard inundation areas.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

	Mitigation Action	Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority⁵
6.8	Require new critical facilities to be built a minimum of 1 foot higher than the anticipated 500-year flood elevation height where feasible.	General Fund, Grants	All	High	2020	Low (0)
Geologic (Landslide, Subsidence)						
7.1	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.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Medium (2)
7.2	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.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Medium (1)
7.3	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.	General Fund, Grants	Public Works, Community Development	Low	Ongoing	Low (0)
Hazardous Materials Release						
8.1	Promote proper disposal of hazardous material items at regional collection centers operated by the County.	General Fund, Grants	City Manager	Low	Ongoing	Low (0)
8.2	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.	General Fund, Grants	Fire	Low	2024	Low (0)
Human-Caused (Aircraft Accident, Civil Disturbance, Cyber Threats, Terrorism, Transportation Accidents)						
9.1	Coordinate with the Orange County Intelligence Assessment Center (OCIAC) to monitor potential incidents resulting in civil disturbance events (riots, mass shootings, etc.).	General Fund, Grants	Police, Fire	Low	Ongoing	Medium (1)
9.2	Disseminate information on cyber threats or potential terrorist activity to City staff and continually follow up with information on further developments in the situation.	General Fund, Grants	City Manager	Low	Ongoing	Medium (1)
9.3	Regularly update cyber security software and educate business owners and residents on current internet-based threats.	General Fund, Grants	Information Technology, Administrative Services (Business Registration Division), City Manager	Medium	Ongoing	Low (0)

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
9.4	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.	General Fund, Grants	Public Works	High	2025	Low (0)
Seismic Hazards (Fault Rupture, Liquefaction, Seismic Shaking)						
10.1	Work with California Geologic Survey and the US Geologic Survey to identify and map the uncharted extents of fault lines within the City.	General Fund, Grants	Community Development	Low	Ongoing	Low (0)
10.2	Regularly update an inventory of buildings within the City that may be seismically vulnerable (adobe brick, unreinforced masonry, etc.)	General Fund, Grants	Community Development	Low	Ongoing	Low (0)
10.3	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.	General Fund, Grants	Community Development	Low	Ongoing	Low (0)
10.4	Incentivize individual property owners to upgrade and retrofit buildings or structures that are susceptible to damage or destruction during a seismic event.	General Fund, Grants	Community Development	Medium	Ongoing	Low (0)
10.5	Inspect all City-designated critical facilities, particularly City Hall and emergency response locations and complete any seismic retrofitting, as necessary.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)
10.6	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.	General Fund, Grants	Public Works, Community Development	High	2026	Not voted upon.
Severe Weather (Extreme Heat, Heavy Rain, Severe Wind)						
11.1	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, sick, lower-income, or persons with limited mobility to better ensure they have adequate time to prepare for a heatwave in advance.	General Fund, Grants	City Manager	Low	Ongoing	Low (0)

TABLE 5-3B: PROPOSED MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ⁵
11.2	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 potentially change as a result of climate change.	General Fund, Grants	Public Works, Parks and Recreation	Medium	2020	Low (0)
11.3	Trim trees that the City determines could blow over during a severe wind event. Move power lines underground when feasible.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)

Relative Costs: Low (\$), \$0–\$25,000; Medium (\$\$), \$25,001–\$500,000; High (\$\$\$), >\$500,000.

NATIONAL FLOOD INSURANCE PROGRAM

Fullerton participates in the National Flood Insurance Program (NFIP), which was created by Congress in 1968 to provide flood insurance at subsidized rates to homeowners who live in flood-prone areas. Individual communities have the option to participate in the NFIP, although property owners who live in nonparticipating communities with flood-prone areas will not be able to buy flood insurance through the program. Additionally, nonparticipating 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 in mapped floodplains (FEMA 2018a). Fullerton has participated in NFIP since 1974 (FEMA 2018b).

Although participation is not a dedicated hazard mitigation action, Fullerton will continue to participate in NFIP and comply with the program's requirements through continued enforcement of the City's Flood Zone Development ordinance (Municipal Code Title 14, Chapter 14.01.015). This ordinance applies to land within the mapped 100-year floodplain and requires any construction activities in the 100-year floodplain to meet stricter standards to ensure that any new or retrofitted developments are more resilient to flood events. The ordinance also requires that structures in the 100-year floodplain be elevated to contend with flood risk. As part of the City's efforts to comply with the NFIP, Fullerton will make updates and revisions to the Flood Zone Development ordinance to minimize the threat of harm from flood events. Specifically, the NFIP requires that communities seeking participation must adopt and enforce floodplain regulation ordinances based on the data provided by their respective floodplain administrator, as required by Code of Federal Regulations 44, 60.2 (h). These updates and revisions may be prompted by changes in local demographics, shifts in land uses, changes to flood regimes such as frequency and intensity of flood events, and other factors that may warrant municipal action. The City will also continue to incorporate any changes to the locations and designations of mapped floodplains into future planning documents, including future updates to this Plan.

As of September 2018, there were 339 properties in Fullerton insured under the NFIP, with a total insured value of approximately \$94.7 million. Since the start of the program, NFIP has paid out 29 claims to Fullerton properties. There is one property in Fullerton that is known as a repetitive loss property, which has filed two claims (2005 and 2010) against its flood insurance (Lohmann 2018). For reference, a repetitive loss property is a property for which two or more flood insurance claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978.

CHAPTER 6

PLAN MAINTENANCE

In order for this LHMP to remain effective and useful to the community of Fullerton, it must remain up to date. An updated version of the LHMP will continue to guide hazard mitigation activities in Fullerton and will help keep the City eligible for state and federal hazard mitigation funding. The LHMP has been structured so that the City can easily update individual sections as new information becomes available and as new needs arise, helping to keep this Plan current.

This chapter discusses how to update this Plan to keep it in compliance with applicable state and federal requirements. This chapter also describes how the City can incorporate the mitigation actions described in Chapter 5 into existing programs and planning mechanisms, and how public participation will remain an important part of Plan monitoring and future update activities.

COORDINATING BODY

The Hazard Mitigation Planning Committee will remain responsible for maintaining and updating the Plan, including evaluating the Plan effectiveness as needed. The members of the Committee will also coordinate implementation of the Plan through their respective positions. A list of the current Committee members is in Chapter 1. In future years, staff and representatives (either current Committee members or other individuals) from the following City organizations should be included in maintenance and update activities:

- Fullerton City Manager’s Office
- Fullerton Community Development
- Fullerton Fire Department
- Fullerton Human Resources Department
- Fullerton Parks and Recreation
- Fullerton Police Department
- Fullerton Public Works Department

As appropriate, staff from other organizations who sat on the Committee during the preparation of this Plan should be invited to participate in future plan maintenance and update activities. Other organizations that could be asked to participate in this process are:

- California Department of Transportation
- California State University, Fullerton
- City of Anaheim
- City of Brea
- City of Buena Park
- City of La Habra
- City of Placentia

- Fullerton College
- Fullerton Joint Union High School District
- Fullerton School District
- Orange County Emergency Management Division
- Orange County Fire Authority
- Orange County Health Care Agency
- Orange County Intelligence and Assessment Center
- Orange County Parks
- Orange County Public Works
- Orange County Sanitation District
- Orange County Sheriff's Department
- Orange County Water District
- Metropolitan Water District of Southern California
- Southern California Edison
- Southern California Gas Company
- St. Jude Medical Center

The staff member currently serving as the Hazard Mitigation Planning Committee (HMPC) leader, the person responsible for coordinating the Committee for future LHMP updates, is in the Community Development Department, and he or she will serve as the project manager during the update process. He or she may also designate this role to another staff member. The HMPC leader or their designee will coordinate maintenance of this Plan, lead the formal Plan review and evaluation activities, direct the Plan update, and assign tasks to other members of the Committee to complete these activities. Such tasks may include collecting data, developing new mitigation actions, updating mitigation actions, making presentations to City staff and community groups, and revising sections of the Plan document.

PLAN IMPLEMENTATION

The effectiveness of the Plan depends on successful implementation of the mitigation actions. This includes integrating mitigation actions into existing City plans, policies, programs, and other implementation mechanisms. The mitigation actions in this Plan are intended to reduce the damage from hazard events, help the City secure funding, and provide a framework for hazard mitigation activities. The members of the Committee have prioritized the hazard mitigation actions, as shown in **Table 5-3** in Chapter 5, and these prioritizations will guide implementation of the actions through new or existing City mechanisms as resources are available. The HMPC leader is responsible for overseeing the implementation, promotion, and maintenance of this Plan. The HMPC leader is also responsible for facilitating meetings and other coordinating activities related to Plan implementation and maintenance.

This Plan works in concert with the Fullerton General Plan, particularly the Safety Element. The Safety Element creates a framework for mitigation and preparation activities and integrates with the goals of this Plan. The LHMP is a way for the City to expand on the goals and policies in the

general plan, identifying specific mitigation actions to achieve the general plan's high-level objectives. The general plan and the LHMP collectively help to reduce the threat from hazardous conditions to Fullerton residents, businesses, visitors, buildings and facilities, infrastructure, key services, ecosystems, and other assets.

In addition to the General Plan, this LHMP should be incorporated into other City documents as applicable. Mitigation actions that involve construction of new City buildings or infrastructure, or major retrofits to existing structures, should be reflected in updates to the Capital Improvement Program. Mitigation actions that improve resiliency in new construction by increasing the standards for new construction should be reflected in updates to Fullerton's Building and Construction Regulations. Revisions to requirements for new construction activities specifically within flood plains should result in changes to the City's Floodplain Management Regulations, and requirements related to seismic retrofits to existing buildings may be implemented through amendments to the City's buildings regulations. Any mitigation actions that change where different developments and land use activities can occur, how they should be sited, and how they can be constructed or operated should be integrated as applicable into the City of Fullerton Zoning Code. Appendix E provides guidance on best practices to accomplish this integration.

PLAN MAINTENANCE

To support maintenance and implementation, this Plan is supported by the Fullerton Mitigation Implementation Handbook, provided in **Appendix E** for reference. The handbook is intended to function as a stand-alone document that gives concise and accessible guidance to jurisdiction staff for implementing and maintaining the Plan. A key component of the handbook is the specific mechanisms that the jurisdiction can use to integrate this plan into other City planning mechanisms.

PLAN EVALUATION

When members of the Committee are not updating the Plan, they should meet at least once a year to go over the implementation of mitigation actions and evaluate the Plan's effectiveness. These meetings should include:

- Discussion of the timing of implementing the mitigation actions.
- Evaluation of the actions that are being implemented and determining if these actions are succeeding.
- Revisions, as needed, of the prioritization of mitigation actions.
- Integration of the mitigation actions into other mechanisms as needed.

The first of these meetings will be held in the 2020 calendar year. To the extent possible, Committee meetings should be scheduled at an appropriate time in the City's annual budgeting process, which will help ensure that funding and staffing needs for mitigation actions are considered.

When the Committee meets to evaluate the Plan, members should consider these questions:

- What hazard events, if any, have occurred in Fullerton in the past year? What were the impacts of these events on the community? Were the impacts mitigated, and if so, how?
- What mitigation actions have been successfully implemented? Have any mitigation actions been implemented but not successfully, and if so, why?
- What mitigation actions, if any, have been scheduled for implementation but have not yet been implemented?
- What is the schedule for implementing future mitigation actions? Is this schedule reasonable? Does the schedule need to be adjusted for future implementation, and are such adjustments appropriate and feasible?
- Have any new issues of concern arisen, including hazard events in other communities or regions, that are not covered by existing mitigation actions?
- Are new data available that could inform updates to the Plan, including data relevant to the hazard profiles and threat assessments?
- Are there any new planning programs, funding sources, or other mechanisms that can support hazard mitigation activities in Fullerton?

PLAN UPDATES

The information in this Plan, including the hazard profiles, threat assessments, and mitigation actions, are based on the best available information, practices, technology, and methods available to the City and Committee at the time this Plan was prepared. As factors change, including technologies, community demographics and characteristics, best practices, and hazard conditions, it is necessary to update the Plan so that it remains relevant. Additionally, Title 44, Section 201.6(d)(3) of the Code of Federal Regulations requires that LHMPs be reviewed, revised, and resubmitted for approval every five years to remain eligible for federal benefits.

UPDATE METHOD AND SCHEDULE

The update process should begin no later than four years after this Plan is adopted, allowing a year for the update process before the Plan expires. The HMPC leader or their designee may also choose to begin the update process sooner, depending on the circumstances. Some reasons for accelerating the update process may include:

- A presidential disaster declaration for Fullerton or for an area that includes part or the entire city.
- A hazard event that results in one or more fatalities in Fullerton.

The update process will add new and updated methods, demographic data, community information, hazard data and events, considerations for threat assessments, mitigation actions,

and other information as necessary. This will help keep the Plan relevant and current. The Committee will determine the best process for updating the Plan, which should include the following steps:

- Involve at least one member from each City department on the Committee or as a supporting role to contribute as needed.
- Contact non-City organizations that sat on the Committee during preparation of the Plan or other relevant entities to gauge their interest and involve them in the update process.
- Review and update the hazard mapping and threat assessment for critical facilities.
- Revise the threat assessment for populations and other assets.
- Review and revise the mitigation actions as needed, including in response to actions that have been completed, changed, cancelled, or postponed.
- Send a draft of the updated Plan to appropriate external agencies.
- Make a draft of the updated Plan available to members of the public for comment.
- Following public review, send a draft of the updated plan to Cal OES and FEMA for review and approval.
- Adopt the final updated Plan within one year of beginning the update process and within five years of the adoption of the previous Plan.

UPDATE ADOPTION

The Fullerton City Council is responsible for adopting this Plan and all future updates. As previously mentioned, adoption should occur every five years, within one year of the commencement of the update process and before the current Plan expires. The adoption should take place after FEMA notifies the City that the Plan is Approved Pending Adoption. Once the City Council adopts the Plan following its approval by FEMA, the Community Development Department will transmit a copy of the adopted Plan to FEMA.

PUBLIC INVOLVEMENT

The City will continue to keep members of the public informed about the Committee's actions to review and update the LHMP. The Committee will develop a revised community engagement strategy that reflects the City's updated needs and capabilities. The updated strategy should include a tentative schedule and plan for public meetings, recommendations for the use of the City website and social media accounts, and content for public outreach documentation. The Committee will also distribute annual progress reports to Fullerton community members.

POINT OF CONTACT

The Hazard Mitigation Planning Committee leader for Fullerton is the primary point of contact for this Plan and for future updates. At the time of writing, this person is Heather Allen, available at (714) 738-6884 or heathera@cityoffullerton.com.

CHAPTER 7

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CHAPTER 2

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CHAPTER 3

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CITY OF FULLERTON

APPENDICES

LOCAL HAZARD MITIGATION PLAN



May 19, 2020

APPENDIX A

MEETING MATERIALS

- Invitation to the Hazard Mitigation Planning Committee
- Composite Attendance List of Hazard Mitigation Planning Committee
- Hazard Mitigation Planning Committee Meeting #1 Agenda and Sign-In Sheet
- Hazard Mitigation Planning Committee Meeting #2 Agenda and Sign-In Sheet
- Hazard Mitigation Planning Committee Meeting #3 Agenda and Sign-In Sheet
- Hazard Mitigation Planning Committee Meeting #4 Agenda and Sign-In Sheet and Hazard Mitigation Actions Table with Committee Annotations

From: Heather Allen
Sent: Wednesday, June 6, 2018 1:12 PM
Cc: Heather Allen
Subject: Hazard Mitigation Planning Committee - City of Fullerton

Good Afternoon -

The City of Fullerton is starting the preparation of their Local Hazard Mitigation Plan Update in June. This plan allows the City access to grant funding sources through FEMA to conduct hazard mitigation planning activities. As part of the plan process, the City and their consultant will be facilitating a series of four meetings to discuss the different elements of the plan. We need your assistance during this process by participating on this committee and attending these meetings. Since we work with your Agency on a regular basis and value your input and knowledge of the issues within the City, we hope that you will join us and participate in the process. If you are unable to attend and/or if there are others in your Agency that should attend, please forward the information to them.

These meetings are expected to last up to 2 hours each and will occur on a monthly basis from June through September from 1:30 p.m. to 3:30 p.m.

Dates and topics are:

- * June 14, 2018 - Introduction and review hazards of concern and critical facilities
- * July 12, 2018 - Review hazard profiles, hazards mapping and overview of risk assessment
- * August 9, 2018 - Review risk assessment analysis and begin mitigation actions development and brainstorming
- * September 13, 2018 - Review, revise, and prioritize mitigation actions and discuss monitoring and implementation

All meetings will be held at the Fullerton Community Center, 340 W Commonwealth Ave, in the Boardroom. Use any entrance and follow the signs for the meeting. Ample parking is located at the rear of the building. I will also be sending meeting requests for the four dates to get this on your calendars.

Once these meetings are complete, we expect to finalize the Administrative Draft document for review and comment sometime in October. Once this process is complete, we ask that you remain available if we have any follow up questions or need additional insight, however we expect this will most likely not be necessary.

We understand the significant commitments you already have, and our goal is to facilitate a process that minimizes your time commitments, while maximizing your effective participation in the process. If you are assigning a staff member to participate please provide their contact information. If you have any questions, please do not hesitate to contact me at HeatherA@ci.fullerton.ca.us<mailto:HeatherA@ci.fullerton.ca.us>

City of Fullerton

Heather Allen, AICP
Planning Consultant
City of Fullerton
Community Development Department
303 W. Commonwealth Ave.
Fullerton, CA 92832

COMPOSITE ATTENDANCE LIST OF HAZARD MITIGATION PLANNING COMMITTEE

Agency	Representative
Fullerton Community Development (Planning)	Heather Allen (Committee Leader)
Fullerton Community Development (Planning)	Matt Foulkes
Fullerton Fire	Adam Loeser
Fullerton Fire	Kathy Schaefer
Fullerton Human Resources	Pamela Mackie
Fullerton Human Resources	Olga Vellanoweth
Fullerton Parks and Recreation	Alice Loya
Fullerton Parks and Recreation	Doug Pickard
Fullerton Police	Rhonda Cleggett
Fullerton Public Works	Dan Diaz
Fullerton Public Works	Hye Jin Lee
Fullerton Public Works	Kevin Kwak
Fullerton Public Works	Wayne Elms
Fullerton Public Works	William Roseberry
Fullerton Public Works	Yelena Voronel
Fullerton School District	Laurie Bruneau
California State University, Fullerton	Pearl Boelter
Caltrans	Julie Lugaro
City of La Habra	Carlos Jaramillo
City of Placentia	Arlen Beck
Fullerton College	Larry Lara
Fullerton Joint Unified School District	Carl Erickson
Metropolitan Water District	Ian Whyte
Orange County Health Care Agency	Rebecca Marsile
Orange County Sanitation District	Rudy Davila
St. Jude Medical Center	Hector Campos

Hazard Mitigation Planning Team Meeting #1

June 14, 2018

1:30-3:30 pm

Fullerton Community Center - BOARDROOM
340 W Commonwealth Avenue
Fullerton, CA

AGENDA


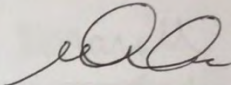
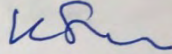
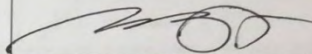
1. Team Introductions (5 minutes)
2. Local Hazard Mitigation Plan Overview (15 minutes)
3. Project Goals and Expectations (10 minutes)
4. Hazard Mitigation Planning Team Roster (10 minutes)
5. Communication Protocols (5 minutes)
6. Data Needs (20 minutes)
7. Community Engagement and Outreach Strategy (10 minutes)
8. Hazard Identification/Prioritization (40 minutes)
9. Next Steps (5 minutes)



**City of Fullerton
Hazard Mitigation Planning Committee Sign-In
June 14, 2018**

Name and Department	Title	Signature
Wayne Ellis Public Works	Landscape SUPERVISOR	W. Ellis
Rhonda Crockett F.P.D.		Rhonda Crockett
Adam Leser FFD	Deputy Chief	Adam Leser
Pamela Mackie HR	Risk Mgt	Pamela Mackie
Deqa HZ	Risk Mgt Spec	Deqa HZ
Micalygo ^{PER}	PER manager	Micalygo

June 14, 2018

 City of Fullerton Hazard Mitigation Planning Committee Sign-In June 14, 2018		
Name and Department	Title	Signature
Arlen Beck City of Placentia Development Services CARL	Planning Technician arlen.beck@placentia.org abeck@placentia.org	Arlen Beck
Dan Diaz PW	Street SUPT	
Kevin Kuzak	Senior Civil PW Eng - Engineer	
RUDY DAVILA ENGINEERING (OCS)	ENGINEER	
Sauri Brunner	Fullerton School District	Sauri Brunner

June 14, 2018



**City of Fullerton
Hazard Mitigation Planning Committee Sign-In
June 14, 2018**

Name and Department	Title	Signature
Julie Lugaro	Caltrans Assoc. Trans planner	Julie Lugaro
Yefena Voronel	Principal Civil Eng City of Fullerton	Y. Voronel
Rebecca Marsile	Orange County Health Care Agency	RMarsile
Doug Pickard	COF Parks: Rec	Doug Pickard
IAN WYZZE MWD	EMERGENCY MANAGEMENT PROGRAM MANAGER	Ian Wyzze
CARL ERICKSON Fullerton Joint Union High School District	DIRECTOR OF PR Risk Management ERICKSON@FSUNSD.ORG	Carl Erickson
Hector Campos ST Jude M-CITY	Services & EV	Hector Campos

June 14, 2018

Hazard Mitigation Planning Team Meeting #2

July 12, 2018


1:30-3:30 pm

Fullerton Community Center - BOARDROOM
340 W Commonwealth Avenue
Fullerton, CA

AGENDA


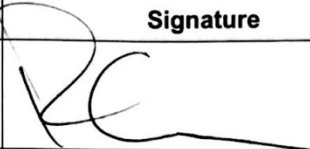



1. Team Introductions (5 minutes)
2. Draft Project Goals (10 minutes)
3. Updated Critical Facilities Inventory (10 minutes)
4. Hazard Prioritization (5 minutes)
5. Hazard Profiles/Mapping (60 minutes)
6. Next Steps (10 minutes)

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 <p style="text-align: center;">City of Fullerton Hazard Mitigation Planning Committee Sign-In July 12, 2018</p>		
Name and Department	Title	Signature
Pamela J Macke HR	Risk Management Analyst	P. J. Macke
Olga Vellanowala HR	Risk Mgmt Specialist	O. Vellanowala
W. G.	Landscape Supv.	W. G.
Dan Diaz	PW/streets	D. Diaz
William ROSEBERRY	PW/BLDG'S - SEWER	W. Roseberry
Rebecca Marsile	Health Educator	R. Marsile
Pearl Bahter	Director SHS CSUF	P. Bahter
Larry Laru Fullerton College	Director of Facilities	L. Laru
Arlen Beck City of Placentia	Planning Technician	A. Beck
Kathy Schaefer Fire.	Division Chief	K. Schaefer
Matt Foulkes Planning. CoFF	Planning manager	M. Foulkes

July 12, 2018

Scanned with CamScanner

 City of Fullerton Hazard Mitigation Planning Committee Sign-In July 12, 2018		
Name and Department	Title	Signature
Russ Gwert	Lt.	
Adam Loeser - Fire	Deputy Chief	
Alicia Lopez	P&R mgr.	
Doug Pickard	P:R Parks Project spec.	

City of Fullerton

Local Hazard Mitigation Plan

1. Hazard Mitigation Planning Committee Meeting #3

Thursday, August 9th, 1:30-3:30 p.m.

Fullerton City Hall

303 W Commonwealth Ave, Fullerton, CA 92832

2. Agenda

- a. Introductions (5 minutes)
- b. Threat Assessment Discussion (45 minutes)
- c. Mitigation Strategies Discussion (30 minutes)
- d. Next Steps (5 minutes)

3. Next Meeting:

Date: **September 13th, 2018**

Time: **1:30-3:30 PM**

Location: **Fullerton City Hall, 303 W Commonwealth Ave, Fullerton, CA 92832**

Topic: **Review of Mitigation Actions**



**City of Fullerton
Hazard Mitigation Plan Planning Meeting Sign-In
August 9, 2018**

Name and Department	Title	Name and Department	Signature	Title
Doug Pickard P:R	Parks Project Specialist			
City of Placentia Arlen Beck	Planning Technician			
ZYONDA CLEGGET	Police			
Randy Max	HR			
Kathy Schaefer	Fire			
Dya Vellmann	HR			
Hector Campos	SF Jude McCall			
Math Foulkes	Planning manager			

August 9, 2018



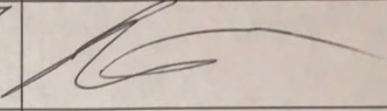
**City of Fullerton
Hazard Mitigation Plan Planning Meeting Sign-In
August 9, 2018**

Name and Department	Title	Signature
Carlos Saramillo	Depto. Dir. City of Fullerton County Department	

August 9, 2018



**City of Fullerton
Hazard Mitigation Plan Planning Meeting Sign-In
August 9, 2018**

Name and Department	Title Name and Department	Signature	Title
IAN WYKOS METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA	EMERGENCY MITIGATION PROGRAM MANAGER		

August 9, 2018

City of Fullerton

Local Hazard Mitigation Plan

1. Hazard Mitigation Planning Committee Meeting #4

Thursday, September 13th, 1:30-3:30 p.m.

Fullerton City Hall

303 W Commonwealth Ave, Fullerton, CA 92832

2. Agenda

- a. Review of Draft Mitigation Actions (75 minutes)
- b. Prioritization of Draft Mitigation Actions (15 minutes)
- c. Q&A (10 minutes)
- d. Next Steps (5 minutes)

3. Next Steps:

Distribution of Administrative Draft LHMP for Team Review



**City of Fullerton
Hazard Mitigation Plan Planning Meeting Sign-In
September 13, 2018**

Name and Department	Title	Signature
Samuel Machic / HA	Risk Management Analyst	<i>[Signature]</i>
Julio Lopez Caltrans	Assoc. Transportation planner	<i>[Signature]</i>
Kathy Schaefer	D. Coy fire	<i>[Signature]</i>
Arlen Beck	City Planning Technician	<i>[Signature]</i>
Doug Pickers CofP Parks? Rec.	Parks Project Specialist	<i>[Signature]</i>
Carlos Jaramilla	City of LA H&V14	<i>[Signature]</i>
William Roseberg	COF	PW maint.
Hector Campes	ST. Jude	<i>[Signature]</i>
Kevin Kwak	Senior Civil Eng.	k kw
Hye Jin Lee	Water sys manager/ Assist. City Eng.	<i>[Signature]</i>
Wayne Elms	Landscape supv.	W. E

Thursday, September 13, 2018

P.D. Have a fulltime EO Coordinator
 TABLE 5-3: MITIGATION ACTIONS

Mitigation Action	Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Timeframe	Priority
Preparedness Activities					
P.1 Continuously research, prepare, and submit applications for hazard mitigation grants.	General Fund, Grants	PL, Public Res. Com. Dev. (A/E)	Low		
P.2 Update Safety Element to incorporate the 2018 Local Hazard Mitigation Plan.	General Fund, Grants	Planning	Low		
P.3 Immediately disseminate information about potential hazard conditions with all City staff and residents and businesses in potential affected areas (i.e. alert homeowners in wildfire hazard zones, if high fire conditions occur, warn property owners in 100-year floodplain if heavy rainfall is expected, etc.).	General Fund, Grants	PL, PIO, Fire	Low		
P.4 Promote and assist business owners in Fullerton to develop and regularly update an emergency preparedness plan. General. Hazard OC	General Fund, Grants	Fire	Low		
P.5 Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Fullerton Public Library, Police and Fire Stations, and any others that the City may so designate in the future. General. Hazard OC	General Fund, Grants	PL	High - Low		
P.6 Organize frequent workshops on emergency preparedness topics (i.e. essential items for emergency kits, evacuation routes, landscaping to reduce runoff and fire risk, etc.) for residents and business owners.	General Fund, Grants	Fire	Low		
P.7 Conduct interjurisdictional trainings with partner first responder agencies in the area, including: CAL FIRE, Orange County Fire Authority, Orange County Sheriff's Department, CSUF University Police, Police and Fire Departments of adjacent cities, and any other agencies that Fullerton may select in the future.	General Fund, Grants	Fire, Police	Low		
P.8 Develop SMART transportation demand management systems to respond to increased volumes of traffic during an evacuation.	General Fund, Grants	PL, Eng	Low - Med		
P.9 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.	General Fund, Grants	Comm Dev., PL	Low		
P.10 Update the Community Forest Master Plan, incorporating drought strategies, and wildfire vulnerabilities into the planning framework.	General Fund, Grants	PL - Land Use	Low		
P.11 Develop partnership with wireless phone towers and communication facilities during emergency situations.	General Fund, Grants	City Mgr., Fire	Low		
Multiple hazards					
M.1 Physically develop (new buildings or existing building retrofits) to submit landscape plans that feature fire-resistant plant specimens and permeable surfaces. (Hazards addressed: Dam Failure, Fire, Flood, Heavy Rain)	General Fund, Grants				
M.2 Frequently assess the areas where critical facilities and areas of elevated hazard risk intersect. (Hazards addressed: Dam Failure, Fire, Flood, Landslide, Subsidence, Hazardous Materials Release, Seismic Shaking, Low-Inflow/Flow, Fault Rupture)	General Fund, Grants	ALL	Low		
M.3 Frequently address structural or operational weaknesses in bridges, dams, retaining walls, etc. to reduce risk of failure during a hazard. (Hazards addressed: All)	General Fund, Grants	Eng., Comm Dev., Army Corps, California	High		
M.4 Exchange SoCalGas, Southern California Edison, Orange County Sanitation District, Metropolitan Water District of Orange County, and Orange County Water District to harden their infrastructure passing through or located in the city to reduce the risk of breach. (Hazards addressed: Dam Failure, Fire, Hazardous Materials Release, Transportation Accidents, Terrorism)	General Fund, Grants	City Mgr., Comm. S.	Low		
M.5 Conduct regular ground cover audits from grass to riparian lawns. (Hazards addressed: Drought, Fire)	General Fund, Grants				
M.6 Remove trees and vegetation along rail rights-of-way and evacuation routes that are likely to impede movement as a result of tree mortality from lightning strikes, fire, and other causes. (Hazards addressed: Transportation Accidents, Drought, Fire, Severe Wind, Transportation Accidents)	General Fund, Grants				
M.7 Install fire generators at key critical facilities (City Hall, Fire Stations, Police Stations, water pumps, etc.) in the event of failure during an emergency. (Hazards addressed: All Hazards)	General Fund, Grants	PL	High		
M.8 Install water storage tanks in riparian corridors to prevent runoff and store stormwater. (Hazards addressed: Drought, Flood)	General Fund, Grants				
M.9 Position new critical facilities outside of elevated hazard risk areas and relocate existing critical facilities outside of hazard risk areas, as feasible. (Hazards addressed: Dam Failure, Drought, Fire, Flood, Geologic, and Seismic)	General Fund, Grants	PL, Comm Dev.	High		
M.10 Plant fire-resistant, drought-tolerant groundcover on slopes, inclines, and hillsides to reduce runoff and erosion during heavy rainfall. (Hazards addressed: Drought, Fire, Flood, Geologic)	General Fund, Grants	PL, Comm Dev.	Med		
M.11 Work with the Army Corps of Engineers to retrofit, strengthen, and increase the capacity of the dams, reservoirs, and retention areas in the City, as appropriate.	General Fund, Grants				
M.12 Inform residents in areas of elevated hazard risk of the risks and proper preparation techniques and evacuation procedures. (Hazards addressed: All)	General Fund, Grants	City Mgr., Admin.	Med		
M.13 Relocate existing critical facilities out of areas of elevated hazard risk, where feasible. (Hazards addressed: All)	General Fund, Grants				
Dam Failure					
D.1 Coordinate with State and Federal agencies to collectively identify threats to the City and the region and identify ways to retrofit/strengthen the dams under their control.	General Fund, Grants	PL, Public Res., City Mgr.	Low		
D.2 Install an early warning alarm to be activated in the parts of Fullerton located within a particular dam failure inundation area should the reservoir(s) breach.	General Fund, Grants	PL	Med		
Disease and pest management					
D.1 Coordinate with health care providers, businesses, schools, the Orange County Health Care Agency, the California Department of Public Health, and Center for Disease Control to inform community members about free and low-cost healthcare options, treatments, and where to find local healthcare facilities. General. Hazard OC	General Fund, Grants	City Mgr., Fire	Low		
D.2 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.	General Fund, Grants	City Mgr.	Low		
D.3 Continue to work with California Public Irrigation Companies to remove dead, dying, and diseased trees weakened by disease/pests.	General Fund, Grants	PL, Comm Dev.	Low - Med		

TABLE 5-3: MITIGATION ACTIONS (continued)

Mitigation Action	Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Timeframe	Priority
F.1 Launch a pilot program with smart water meters to track water usage in 500 homes across the City.	General Fund, Grants	PL	High		
F.2 Identify opportunities (grant funding, design assistance, etc.) to sponsor homeowner retrofits from lawns to low-water consuming plants.	General Fund, Grants	PL	Med		
Fire					
F.1 Create a hillside weed abatement pilot program using goats, or other livestock to reduce fuel loads in fire prone areas.	General Fund, Grants	Fire	Med		
F.2 Continue fire hazard prevention awareness campaigns to residents in the High and Very High Fire Hazard Severity Zones.	General Fund, Grants	Fire, Med	Med		
F.3 Expand the existing home preparedness assessment program to assist more residents in understanding and addressing their wildfire risk.	General Fund, Grants	Fire, Med	Med		
F.4 Obtain a Type 3 Fire Engine to respond to potential fire threats in the fire hazard prone areas of the City.	General Fund, Grants	Fire, PL	High		
F.5 Harden and regularly inspect fire retardant infrastructure such as sprinklers, fire hose terminals, and fire suppression systems in critical facilities.	General Fund, Grants	Fire, PL	Med		
F.6 Draft and adopt a Community Wildfire Preparedness Plan for areas within the City within the Very High, High, and Moderate Fire Hazard Severity Zones.	General Fund, Grants	Fire	Med		
F.7 Require all new development in Very High, High, and Moderate Fire Hazard Severity Zones to use non-combustible 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.	General Fund, Grants	Comm Dev., Fire	Low		
F.8 Remove all dead trees and any other highly flammable vegetation in Very High, High, and Moderate Fire Hazard Severity Zones and replant with fire-tolerant specimens.	General Fund, Grants	PL	Low - Med		
F.9 Remove all dead trees to be quickly checked to prevent potential hazardous tree falls.	General Fund, Grants	PL	Med		
F.10 Clear dead vegetation in riparian corridors, railroad rights-of-way, parks, and open spaces especially during and after a drought episode.	General Fund, Grants	PL	Med		
F.11 Replace pressure water pumps with gravity fed mechanisms to ensure fire fighting efforts are sustained in case power is lost during a fire.	General Fund, Grants	Fire	Low		
F.12 Create a rapid response team from among Fullerton's and Orange County's first responders to secure nursing and assisted living facilities as many of them are located within fire hazard severity zones.	General Fund, Grants	Fire	Low		
Flood					
F.1 Keep all flood control channels clear of debris and plant debris that could affect the capacity of the channel during heavy rainfall events. Install large grates over storm drain inlets to screen out larger debris.	General Fund, Grants	PL	Med		
F.2 Continually update the mapped boundaries of floodplain inundation zones within the City.	General Fund, Grants	PL	Med		
F.3 Mow the design of culverts to incorporate open-bottom, ripraped medians, and other permeable surfaces that improve storm drain capacity.	General Fund, Grants	PL	Med		
F.4 Update the City's Drainage Area Map on a regular basis to incorporate new data and/or address emerging issues.	General Fund, Grants	PL	High		
F.5 Continually pursue FEMA elevation certification for all structures in Fullerton.	General Fund, Grants	PL	Med		
F.6 Upgrade riparian wetlands using systems designed to allow the City's residents to sustain riparian flood insurance rates.	General Fund, Grants	PL	Med		
F.7 Place riparian wetlands in riparian corridors to always be wet over flood channels.	General Fund, Grants	PL	Med		
F.8 Increase riparian wetlands in riparian corridors to always be wet over flood channels.	General Fund, Grants	PL	Med		
F.9 Require new critical facilities to be built a minimum of 1 foot higher than the anticipated 500-year flood elevation height.	General Fund, Grants	ALL	High		
F.10 Create areas with permeable pavements and other systems as an interim solution to flood control channel expansion. These solutions can help to absorb runoff and prevent the flood control channels from reaching over capacity during a storm.	General Fund, Grants		High		

TABLE 5-3: MITIGATION ACTIONS

	Mitigation Action	Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Timeframe	Priority
10.4	Incentivize individual property owners to upgrade and retrofit buildings or structures that are susceptible to damage or destruction during a seismic event.	General Fund, Grants	Comm Dev	Med		
10.5	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.	General Fund, Grants	Comm Dev	Low		
10.9	Work with local gas to ensure that high pressure natural gas lines are seismically retrofitted to the highest standards. Explore use of materials that can reduce the force of seismic shaking on the pipelines.	General Fund, Grants	City Mgr	Low		
Severe Weather (Extreme Heat, Heavy Rain, Severe Wind)						
11.1	Develop and fund shelters that are open to the public with pets are able to seek shelter during extreme heat events.	General Fund, Grants				
11.2	Notify residents through public service announcements a couple days in advance of a heatwave. Focus on media methods that target vulnerable populations, such as elderly, sick, lower-income, or persons with limited mobility to better ensure they have adequate time to prepare for a heatwave in advance.	General Fund, Grants	City Mgr	Low		
11.3	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 potentially changes as a result of climate change.	General Fund, Grants	Pln, Parks Rec	Med		
11.4	Require the Emergency Operations Coordinator to regularly monitor NOAA warnings of severe wind, heat, or rain, and issue advisories to homes of Fullerton using email, radio, and television broadcasts, and social media.	General Fund, Grants				

\$ 25,000
 \$\$ 25,001 - 499,999
 \$\$\$ +500,000

APPENDIX B

COMMUNITY OUTREACH MATERIALS

- Community Engagement Strategy
- City of Fullerton LHMP Website
- Fullerton LHMP Press Release
- Fullerton Observer News Clipping
- Public Input Meeting Presentation
- Fullerton LHMP Online Survey Results

COMMUNITY ENGAGEMENT STRATEGY

The City of Fullerton is currently developing a Local Hazard Mitigation Plan (LHMP), which will be the strategic plan to assess and reduce the threats that the community faces from current and future hazard conditions. Based on preliminary discussions, these hazards are:

- Geologic Hazards (faulting seismicity, liquefaction/landslide)
- Fire Hazards (urban and wildland)
- Flooding and Dam Failure

Guidelines from the Federal Emergency Management Agency (FEMA) requires that the City create opportunities for members of the public to be involved in the development of the plan, at a minimum during its initial drafting stage and during plan approval, and that such opportunities be documented. This process helps ensure that the LHMP reflects community values, concerns, and priorities. Fullerton will follow these guidelines when preparing its LHMP, and will go above the minimum FEMA requirements to secure more extensive community involvement as opportunities allow.

The overarching goals of the LHMP document as are follows:

- Enhance the resilience of community members, private property, and natural systems to hazard events.
- Keep critical services and government functions operational by protecting key infrastructure in Fullerton.
- Ensure that the City of Fullerton is eligible for increased funding for hazard mitigation and disaster recover activities.
- Support compliance with state laws that require addressing specific hazards and other items, including the effects of climate change.

These goals will be reflected throughout the community outreach process, with the intent to educate community members and obtain feedback in an open and transparent manner to support preparation of the LHMP. The engagement process should be respectful and neutral, providing all participants with the opportunity to express their opinions in a productive way. This Community Engagement Strategy describes how Fullerton will conduct outreach to members of the local community and other stakeholders of importance, in a flexible and outcome-oriented manner.

PROJECT TEAM AND RESPONSIBILITIES

The LHMP is being prepared by a project team, comprised of members from the City's Hazard Mitigation Planning Committee (HMPC), key stakeholders (as discussed in the Community Members section), and technical consulting firm PlaceWorks. The HMPC members are as follows:

Key Terms

Hazard: A natural or human-caused event with the potential to cause damage.

Resiliency: The ability of a population or asset to reduce a threat.

Risk: The chance that a hazard, especially one of a particular size or intensity, will occur.

Threat: The potential of a hazard to do harm.

Vulnerability: A weakness that increases the threat posed to a population or asset.

- Heather Allen: Planning Consultant, Community Development Department (HMPC Leader)
- Staff or representative from the following departments:
 - Airport
 - City Manager
 - Community Development
 - Fire
 - Human Resources
 - Parks & Recreation
 - Police
 - Public Works

The members of the HMPC will be responsible for reviewing all proposed methods, materials, and content for outreach activities. As the local experts, they will be able to provide valuable information about how best to reach community members, and to share information and receive feedback effectively. It is likely that at least one member of the HMPC, Heather Allen or a designee, will attend meetings and other outreach events to serve as a representative of the City. HMPC staff will serve as the primary liaisons with community members on the project (e.g. answering public inquiries about the LHMP), and will be responsible for distributing content through the preferred means.

Members of the project team from PlaceWorks will prepare a description of the recommended community engagement strategy, as well as materials and content for outreach activities. This may include digital and print materials, as well as any other items used for community engagement. At least one member of the PlaceWorks team will attend meetings and other outreach events, helping to facilitate the event and serving as technical experts as needed. PlaceWorks will also be responsible for collecting and analyzing the results of engagement activities, and sharing these results with other members of the project team.

COMMUNITY MEMBERS/ KEY STAKEHOLDERS

During community engagement activities, the project team will reach out to two groups of community members. The project team will engage members of the general public, which includes people who live and/or work in Fullerton, as well as those who own property or run businesses in the community. Additionally, the project team will work with key stakeholders, who represent agencies, businesses, or other organizations that are present in the community or are otherwise important to local health, safety, and quality of life. Such stakeholders do not include representatives from City agencies. The project team anticipates the following key stakeholders:

- California Department of Transportation
- City of Anaheim
- City of Brea
- City of Buena Park
- City of Placentia
- Orange County Emergency Management Division

- Orange County Fire Authority
- Orange County Health Care Agency
- Orange County Intelligence Assessment Center
- Orange County Water District
- Orange County Public Works
- Orange County Sanitation District
- Southern California Edison
- Southern California Gas Company

Other stakeholders important to the community that will be engaged during the process include:

- California State University, Fullerton
- Fullerton College
- Fullerton Joint Union High School District
- Fullerton School District
- St. Jude Medical Center

Modifications to this list may occur throughout the process if additional stakeholders are identified.

PUBLIC MEETINGS

In-person public meetings allow members of the Fullerton community to learn about the LHMP, including the process of the plan development, hazards of concern, and feasible steps the City and community members can take to improve resiliency. These meetings allow for members of the community to speak directly to City staff and other stakeholders about the project, and to provide useful feedback. Discussions at in-person meetings are often more detailed and involved than those through online media.

All meetings will emphasize the project goals and the City's intent in preparing the LHMP, as discussed above. The meetings will also provide an opportunity for members of the project team to address any misconceptions about the LHMP. Educational material to correct other misconceptions that may arise could be distributed as part of other outreach activities, including being posted online and on the City's social media accounts. Example misconceptions may include:

- "Fullerton must have an LHMP to receive disaster relief funding". In actuality, communities are eligible for federal disaster relief funding regardless of whether they have an LHMP or not. However, the State of California limits its share of disaster relief funding to 75 percent of the costs not paid by the federal government unless the community has a valid LHMP, at which point the State may pay more than 75 percent.
- "The LHMP must analyze all potential hazards". An LHMP must only look at natural hazards. Human-caused hazards may be included for the sake of improving overall community safety, but are not necessary. FEMA only provides funding to help mitigate natural hazards.

The City is planning to hold 2 public meetings at key stages of the process.

MEETING 1 – PUBLIC INPUT MEETING

This meeting will occur as a study session with the Planning Commission. At this meeting, City staff and other members of the project team will share information about the LHMP and what it is, the process used to prepare it, and future opportunities for engagement. This meeting will provide opportunities for community members to learn about the project and explain, from their perspective, what they think is most important for the City to know and address in the LHMP. A graphically-oriented PowerPoint presentation will be used to explain the concepts of hazard mitigation planning to the meeting attendees.

This meeting is currently scheduled for some time between September to October in conjunction with an existing Planning Commission hearing.

MEETING 2 – FINAL ADOPTION HEARING

At this meeting, City staff will present the final plan for adoption by the City. Adoption of the plan occurs upon receipt of final approval notification from the Federal Emergency Management Agency (FEMA). This meeting will involve a presentation by the project team and allow for opportunities for questions and clarifications by the Council and public.

This meeting will be scheduled upon receipt of FEMA approval. This is anticipated to occur in Spring 2019.

ONLINE AND MEDIA ENGAGEMENT

Engagement through online systems and media outlets allows the City to reach a wide audience without requiring extensive effort by project staff. Online methods are well suited to receive community input on specific issues, and allow community members to participate who may be unable to attend in-person meetings. Local media outlets allow the City to easily send out notifications and other information that reaches a large segment of the community. There are multiple elements of online and media engagement that will be used during the development of the Fullerton LHMP.

PROJECT WEBSITE

The project website will be a simple, one-stop location for community members to learn about the LHMP. It will contain information about what an LHMP is, why the City is preparing one, and how community members can get involved, along with other topics. The website will also include links to materials and plan documents as they become available, and will contain notifications about upcoming events related to the plan development. A link to the website at the time of this document's preparation is included here:

<http://www.cityoffullerton.com/LHMP>

SOCIAL MEDIA

The use of social media accounts, such as Facebook and Twitter, is an easy way for the City to send quick notifications or bursts of information about the project to a large number of community members. The

City can use its social media accounts to send out information about upcoming events or other opportunities for public involvement. The following are a list of existing accounts that could be used:

- Facebook: City, Police Department
- Twitter: City, Police Department
- NextDoor

ONLINE SURVEY

The online survey is an effective way to collect information and comments from community members about issues of importance to the LHMP. The survey will include questions about community members' past experience and familiarity with emergency conditions, level of preparedness for future emergencies, and preferred actions for the City to take to increase community resiliency, along with other questions that the project team chooses to add. Links to the survey can be posted on the project website and distributed through social media announcements. The project team can also distribute paper copies of the survey during community events or meetings, if desired.

PRESS RELEASES

Press releases allow the City to send out information about upcoming project milestones or other notifications to local media outlets, including print media, television, and radio. The City can use these documents to alert members of the public about the status of the project and upcoming events, often in conjunction with postings on social media and on the project website. The number of press releases should be limited (e.g. one to announce the beginning of public engagement, one to announce the release of the public draft plan, and potentially a third if warranted), as too many press releases will likely be ignored.

CONTENT FOR ONLINE AND MEDIA ENGAGEMENT

The following material can be used for the online and media engagement components of the community engagement strategy. It can also be adapted and revised as the project proceeds and specifics change.

PROJECT WEBSITE CONTENT

Local Hazard Mitigation Plan

The City of Fullerton is preparing a Local Hazard Mitigation Plan, or LHMP. This plan will help create a safer community for residents, businesses, and visitors. The LHMP allows public safety officials and city staff, elected officials, and members of the public understand the threats from natural and human-caused hazards in our community. The plan will also recommend specific actions to proactively decrease these threats before disasters occur.

Why have an LHMP?

An LHMP will let Fullerton plan for future emergencies. Usually, after a disaster occurs, communities take steps to recover from the emergency and rebuild. A LHMP is a way for the City to become more prepared in advance of these disasters, so when they do occur, less damage occurs and recovery is easier. Our community can use LHMP strategies to reduce instances of property damage, injury, and loss of life from disasters. Besides protecting public health and safety, this approach can save money. Studies estimate that every dollar spent on mitigation saves an average of four dollars on response and recovery costs. An LHMP can also help to strengthen the mission of public safety officers, such as police and fire department staff, providing them with clear roles and responsibilities to build a safer community.

Besides helping to protect Fullerton, our LHMP will make the City eligible for grants from the Federal Emergency Management Agency (FEMA) that can be used to further improve safety and preparedness in the community. Having an adopted LHMP can also make Fullerton eligible to receive more financial assistance from the State when disasters do occur.

What is in our LHMP?

The City of Fullerton LHMP includes four main sections:

- A summary of the natural and human-caused hazards that pose a risk to our community. This will include descriptions of past disaster events and the chances of these disasters occurring in the future.
- An assessment of the threat to Fullerton, which will describe how our community is vulnerable to future disasters. The plan will look at the threat to important buildings and infrastructure, such as police and fire stations, hospitals, roads, and utility lines. It will also look at the threat to community members, particularly disadvantaged persons.
- A hazard mitigation strategy, which will lay out specific policy recommendations for Fullerton to carry out over the next five years. These recommendations will help reduce the threat that our community faces from hazard events.
- A section on maintaining the plan, which will help ensure that our LHMP is kept up-to-date. This will make it easier for us to continue to proactively protect ourselves, and will also keep the City eligible for additional funding.

What hazards will our LHMP help protect against?

The City plans to include the following natural hazards in our LHMP:

- Geologic Hazards (faulting seismicity, liquefaction/landslide)
- Fire Hazards (urban and wildland)
- Flooding and Dam Failure

Our LHMP will also look at how climate change may affect these hazards and may include other hazards that pose a threat to our community.

How is our LHMP being prepared?

The City has assembled a Hazard Mitigation Planning Committee (HMPC), which includes representatives from public safety officials and City departments, and will guide the overall development of our LHMP. The HMPC is supported by key stakeholders, and technical consultants. Together, these participants form the project team responsible for preparing our plan.

When will our LHMP be done?

The project team plans to release a first draft of the Fullerton LHMP for public review in Fall 2018. After members of the public provide comments and feedback, the project team will revise the plan, and send it to state and federal agencies for review and approval. Once approved by state and federal agencies, the Fullerton City Council will approve the final LHMP. We hope to have the plan ready for adoption in the early 2019, but it may be later depending how long state and federal review takes.

How can I get involved?

You can get involved in preparing our LHMP in different ways.

- The project team will hold public meetings to share information about our LHMP and obtain community feedback. The first of these meetings is scheduled for **Day, Date, 2018**.
- The City will release an online survey to members of the public in the spring of 2018, asking for information about past experience with natural hazards and how our LHMP can be the most useful. Take the survey when it comes out, and encourage your friends and family to do the same.
- The City will release a draft of the completed LHMP for public review. Please review and provide comments on this document, either at in-person meetings or in writing.
- Encourage members of the Fullerton City Council to adopt the plan. Then, encourage them to put the plan into effect.
- Reach out to the project team **[insert contact information]** for more ways to stay involved.

What can I do now to be better prepared for disasters?

- Know the hazards that may affect you at your home, work, or school. You can find out more at <http://myhazards.caloes.ca.gov/>.
- Assemble an emergency kit for your home. In a disaster, you may have to rely on supplies in your emergency kit for at least three days. Be sure to include supplies for any pets and anyone in your home with special needs. Learn more at <https://www.ready.gov/build-a-kit>.
- Have a disaster plan for your household, including how people should contact each other if a disaster occurs and where you should meet.
- Learn about your neighbors and how to help them. In a disaster, emergency responders may not be able to reach your neighborhood for a while. Know if your neighbors have any special needs, and be sure to check on them as soon as you can.
- Make sure your homeowner's or renter's insurance covers you from disasters such as earthquakes and floods. If these disasters occur, having good insurance coverage will help you recover easier.
- Volunteer with an emergency response or community service organization that does work on disaster education and preparation.

- Speak to your employer about creating a disaster recovery, workforce communication, and/or business continuity plan. If they already have one or more of these plans in place, make sure you and your co-workers know it.
- Fullerton Community Emergency Response Team, a group of volunteers trained by the Fullerton Fire Department to assist emergency responders during disasters. Training is free and offered at times throughout the year. Learn more at:
https://www.cityoffullerton.com/gov/departments/fire/emergency_preparedness/cert/default.asp

SOCIAL MEDIA POSTS

Facebook

Project/meeting announcement

Help us build a safer Fullerton! Our city is currently preparing a Local Hazard Mitigation Plan (LHMP), which will provide information about our community's vulnerabilities to disasters and what we can do to be more prepared. Come to [LOCATION] at [TIME] on [DATE] to learn more and get involved. Additional information is located here: [PROJECT WEBSITE].

Survey

Let your voice be heard as we plan for a safer Fullerton! Our city is looking for engaged community members to take a quick survey on hazards and emergency preparations. Your responses will help in the preparation of our Local Hazard Mitigation Plan (LHMP). All survey responses are completely anonymous. Take the survey at [SURVEY LINK] and learn more about the LHMP at [PROJECT WEBSITE].

Public plan release

With the help of our active and involved community members, we have prepared a first draft of our Local Hazard Mitigation Plan (LHMP). This plan will help our community learn about and prepare for future emergencies, building a safer Fullerton for everyone. You can read the plan at [LINK], and submit comments for how to make the LHMP better at [COMMENT FIELD/WEBSITE/EMAIL ADDRESS]. You can also make in-person comments at our public meeting at [LOCATION] at [TIME] on [DAY]. Help us make our LHMP the best it can be!

Twitter

Project/meeting announcement

Our city is writing a new plan to help us build a safer Fullerton. Come to our public kickoff meeting to learn more and get involved! [Link to webpage announcement – use URL shortener]

Survey

We want your opinion to help us build a safer Fullerton! Take a few minutes to take our Local Hazard Mitigation Plan survey at [\[Link to survey – use URL shortener\]](#).

Public plan release

The first draft of our plan to help us build a safer Fullerton for everyone is out! Read the plan and comment online or in person. Learn more at [\[Link to website post – use URL shortener\]](#).

SAMPLE PRESS RELEASE

The City of Fullerton has begun preparation of a Local Hazard Mitigation Plan (LHMP), a five-year strategic plan to improve local resilience to hazard events. Development of the plan, the first such plan for Fullerton, is being funded through a grant from the Federal Emergency Management Agency (FEMA). The plan is being prepared by public safety officials and City staff, with support from key stakeholders, other affected agencies, and technical consultants. It will also incorporate regular feedback from key Fullerton community members. The City plans to release a draft of the plan for public review in January of 2018, with final adoption planned for summer of 2018 following approval from the California Office of Emergency Services and FEMA.

The Fullerton LHMP will summarize the natural and human-caused hazards that pose a threat to the community, including drought, flooding, earthquakes, and wildfires. As a part of this process, the plan will identify how climate change is expected to affect future hazards in Fullerton. The LHMP will analyze how community members, buildings, and infrastructure are vulnerable to the threats posed by these hazards. It will outline a Hazard Mitigation Strategy that will provide specific policy and action recommendations to City staff and community partners to improve overall resiliency to hazard events. The plan will also include steps to maintain it and keep it updated, including keeping the plan current in the face of changing conditions.

In addition to protecting Fullerton from current and future hazards, having an LHMP will allow Fullerton to be eligible for grants from FEMA for additional hazard mitigation efforts, under the provisions of the federal Robert T. Stafford Act and the Disaster Mitigation Act of 2000. It will also make Fullerton eligible to receive additional disaster relief funding from the State of California, per California Government Code Section 8685.9.

CITY OF FULLERTON LHMP WEBSITE

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Local Hazard Mitigation Plan

Community Development
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Commissions & Committees
Contact Us
Demographics
Development Activity
FAQs
General Plan
Historic Preservation
Housing & Neighborhood Services
Inspections
Marijuana
Permits Online
Public Notices
Planning & Zoning
West Coyote Hills
DowntownGamePlan
1600 West Commonwealth

Local Hazard Mitigation Plan

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What is in our LHMP?

The City of Fullerton LHMP includes four main sections:

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How can I get involved?

You can get involved in preparing our LHMP in different ways.

- The project team will hold public meetings to share information about our LHMP and obtain community feedback. The first of these meetings is scheduled for October 10 at 7:00pm in the Fullerton City Council Chambers in conjunction with the Planning Commission meeting.
- The City has prepared an online survey for members of the public, asking for information about past experience with natural hazards and how our LHMP can be the most useful. Take the survey at <https://www.surveymonkey.com/r/KB6XP7D>, and encourage your friends and family to do the same.
- The City will release a draft of the completed LHMP for public review. The draft will be available from this webpage. Please review and provide comments on this document, either at in-person meetings or in writing.
- Encourage members of the Fullerton City Council to adopt the plan. Then, encourage them to put the plan into effect.
- Reach out to the project team through Heather Allen at heathera@cityoffullerton.com for more ways to stay involved.

What can I do now to be better prepared for disasters?

- Know the hazards that may affect you at your home, work, or school. You can find out more at <http://myhazards.caloes.ca.gov/>.
- Assemble an emergency kit for your home. In a disaster, you may have to rely on supplies in your emergency kit for at least three days. Be sure to include supplies for any pets and anyone in your home with special needs. Learn more at <https://www.ready.gov/build-a-kit>.
- Have a disaster plan for your household, including how people should contact each other if a disaster occurs and where you should meet.



- Encourage members of the Fullerton City Council to adopt the plan. Then, encourage them to put the plan into effect.
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- Have a disaster plan for your household, including how people should contact each other if a disaster occurs and where you should meet.
- Learn about your neighbors and how to help them. In a disaster, emergency responders may not be able to reach your neighborhood for a while. Know if your neighbors have any special needs, and be sure to check on them as soon as you can.
- Make sure your homeowner's or renter's insurance covers you from disasters such as earthquakes and floods. If these disasters occur, having good insurance coverage will help you recover easier.
- Volunteer with an emergency response or community service organization that does work on disaster education and preparation.
- Speak to your employer about creating a disaster recovery, workforce communication, and/or business continuity plan. If they already have one or more of these plans in place, make sure you and your co-workers know it.
- Join the Fullerton Community Emergency Response Team, a group of volunteers trained by the Fullerton Fire Department to assist emergency responders during disasters. Training is free and offered at times throughout the year. Learn more at: https://www.cityoffullerton.com/gov/departments/fire/emergency_preparedness/cert/default.asp



Select Language

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FULLERTON LHMP PRESS RELEASE



Press Release

City of Fullerton

Date: September 27, 2018
Contact: Stephen Hale, Public Information Coordinator
(714) 738-6317
SHale@cityoffullerton.com

FOR IMMEDIATE RELEASE

Fullerton to Hold Public Input Meeting on the Local Hazard Mitigation Plan

FULLERTON, Calif. (September 27, 2018) — The City of Fullerton has begun preparation of a Local Hazard Mitigation Plan (LHMP), a five-year strategic plan to improve local resilience to hazard events. As part of the planning process, a public input meeting will be held on **Wednesday, October 10, 2018 at 7:00 p.m.** in conjunction with the regular meeting of the Planning Commission in the Fullerton City Council Chamber, 303 West Commonwealth Avenue, Fullerton, CA 92832.

Development of the plan is being funded through a grant from the Federal Emergency Management Agency (FEMA). The plan is being prepared by public safety officials and City staff, with support from key stakeholders, other affected agencies, and technical consultants. It will also incorporate regular feedback from key Fullerton community members. The City plans to release a draft of the plan for public review in Fall 2018, with final adoption planned for 2019 following approval from the California Office of Emergency Services and FEMA.

The Fullerton LHMP will summarize the natural and human-caused hazards that pose a threat to the community, including drought, flooding, earthquakes, and wildfires. As a part of this process, the plan will identify how climate change is expected to affect future hazards in Fullerton. The LHMP will analyze how community members, buildings, and infrastructure are vulnerable to the threats posed by these hazards. It will outline a Hazard Mitigation Strategy that will provide specific policy and action recommendations to City staff and community partners to improve overall resiliency to hazard events. The plan will also include steps to maintain it and keep it updated, including keeping the plan current in the face of changing conditions.

In addition to protecting Fullerton from current and future hazards, having an LHMP will allow Fullerton to be eligible for grants from FEMA for additional hazard mitigation efforts, under the provisions of the federal Robert T. Stafford Act and the Disaster Mitigation Act of 2000. It will also make Fullerton eligible to receive additional disaster relief funding from the State of California.

The City has prepared an online survey for members of the public, asking for information about past experience with natural hazards and how our LHMP can be the most useful. Take the survey at www.surveymonkey.com/r/KB6XP7D. Learn more about the LHMP at www.cityoffullerton.com/LHMP.

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FULLERTON OBSERVER NEWS CLIPPING

Page 2 OBSERVER

REGIONAL AND LOCAL NEWS

EARLY SEPTEMBER 2018



BICYCLISTS OF THE MONTH: Kelsey Ridge & Kids were seen peddling through downtown. All had their safety helmets on! - PHOTO BY MALIKA PANDEY

Local Hazard Survey Online as Fullerton Prepares Mitigation Plan

The City of Fullerton has begun preparation of a Local Hazard Mitigation Plan (LHMP), a five-year strategic plan to improve local response to hazardous events.

Development of the plan is being funded through a grant from the Federal Emergency Management Agency (FEMA). The plan is being prepared by public safety officials and city staff, affected agencies, and technical consultants.

The city will release a draft of the plan for public review in Fall 2018, with final adoption planned for 2019 following approval from the California Office of Emergency Services and FEMA.

The Fullerton LHMP will summarize the natural and human-caused hazards that pose a threat to the community, including drought, flooding, earthquakes, and wildfires. As a part of this process, the plan will identify how climate change is expected to affect Fullerton. The LHMP provide specific

policy and action recommendations to improve overall policy in response to hazardous events. In addition to protecting Fullerton from current and future hazards, having an LHMP will allow Fullerton to be eligible for grants from FEMA for additional hazard mitigation efforts, under the provisions of the federal Robert T. Stafford Act and the Disaster Mitigation Act of 2000. It will also make Fullerton eligible to receive additional disaster relief funding from the State of California.

The City has prepared an online survey for members of the public, asking for information about past experience with natural hazards and how our LHMP can be the most useful.

Take the survey by visiting www.surveymonkey.com/r/KB6XP7D.

Learn more about the LHMP at www.cityoffullerton.com/LHMP.

TURPENTINE SMELLS REPORTED

PUBLIC INPUT MEETING PRESENTATION

[See pages B-18 to B-39]



Agenda/Overview

Project Background

Project Funding

Hazard Mitigation Planning Committee

Overview of the Plan Development Process

Planning Outcomes (Community Input)

Public Engagement Opportunities

Questions and Answers

Project Background

What

- Preparation of a Local Hazard Mitigation Plan (LHMP) Update

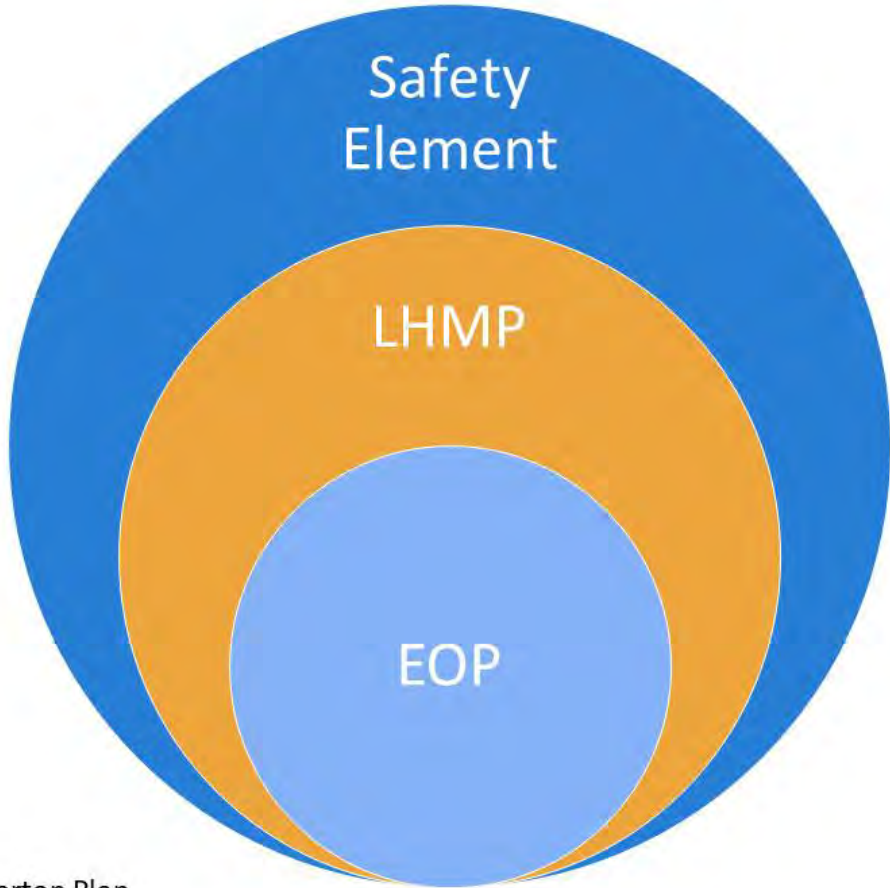
Who

- Led by Fullerton Community Development Department

Why

- Assist the City with future mitigation grant opportunities

How
<ul style="list-style-type: none">• Integrate the LHMP with the City's General Plan Safety Element* to comply with recent legislation



*Safety Element = Natural Hazards Chapter of The Fullerton Plan

What is Hazard Mitigation



Project Funding/ Future Funding

- Received a Grant from the Federal Emergency Management Agency (FEMA) for the plan
- City staff time applies to the grant funding match requirements



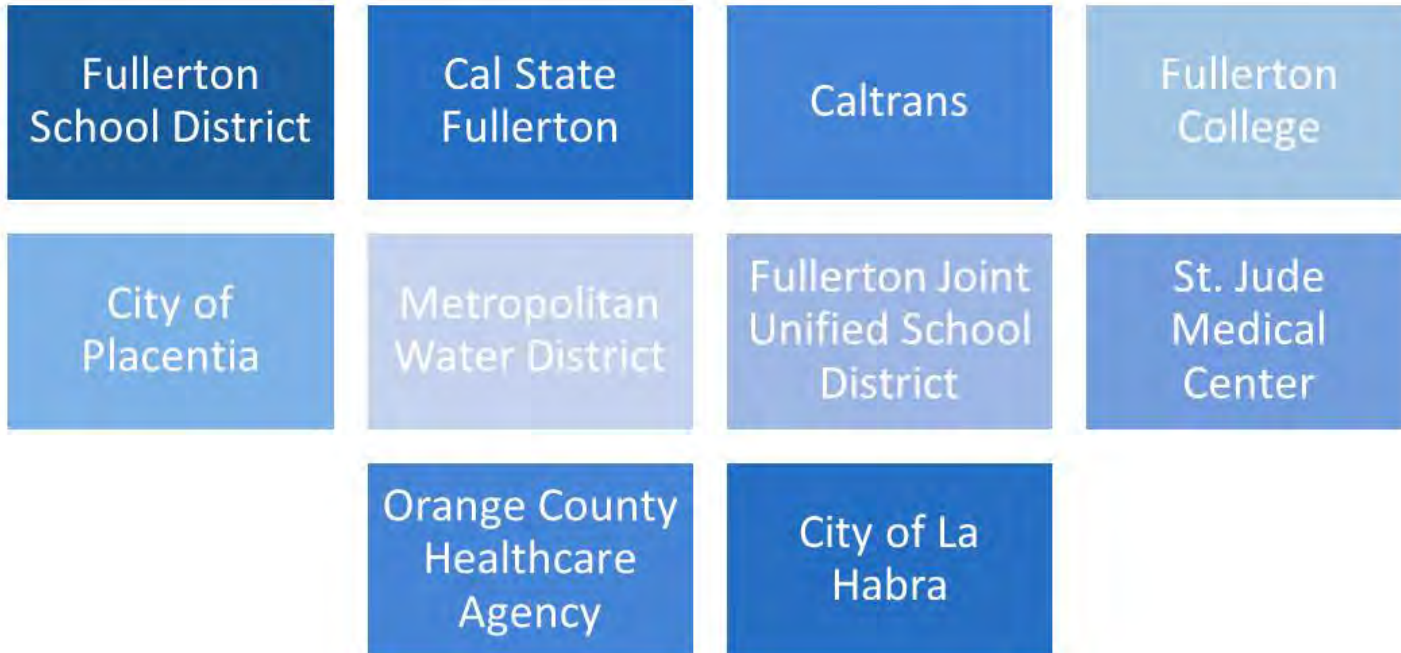
**Once Adopted, eligible
for future grant funding
opportunities
(PDM, HMGP, FMA)**



Hazard Mitigation Planning Committee



Hazard Mitigation Planning Committee: External Stakeholders



Misconceptions

“Fullerton must have an LHMP to receive disaster relief funding”.

 **FALSE**

In actuality, communities are eligible for federal disaster relief funding regardless of whether they have an LHMP or not. However, the State of California limits its share of disaster relief funding to 75 percent of the costs not paid by the federal government unless the community has a valid LHMP, at which point the State may pay more than 75 percent.

Misconceptions

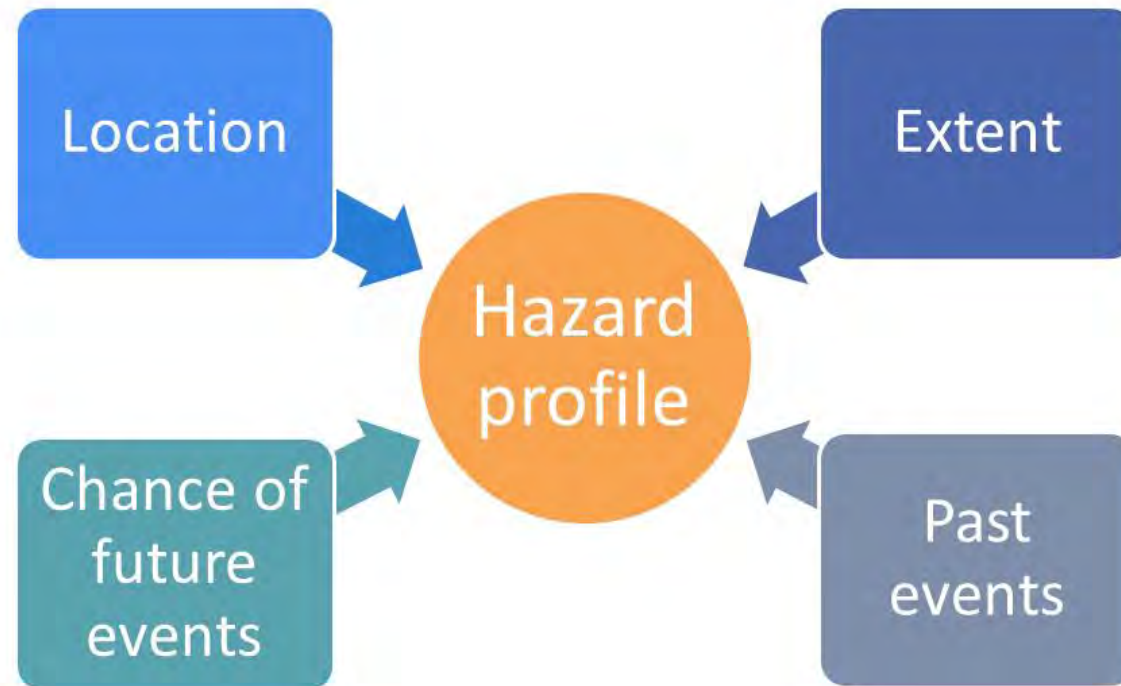
“The LHMP must analyze all potential hazards”.

 **FALSE**

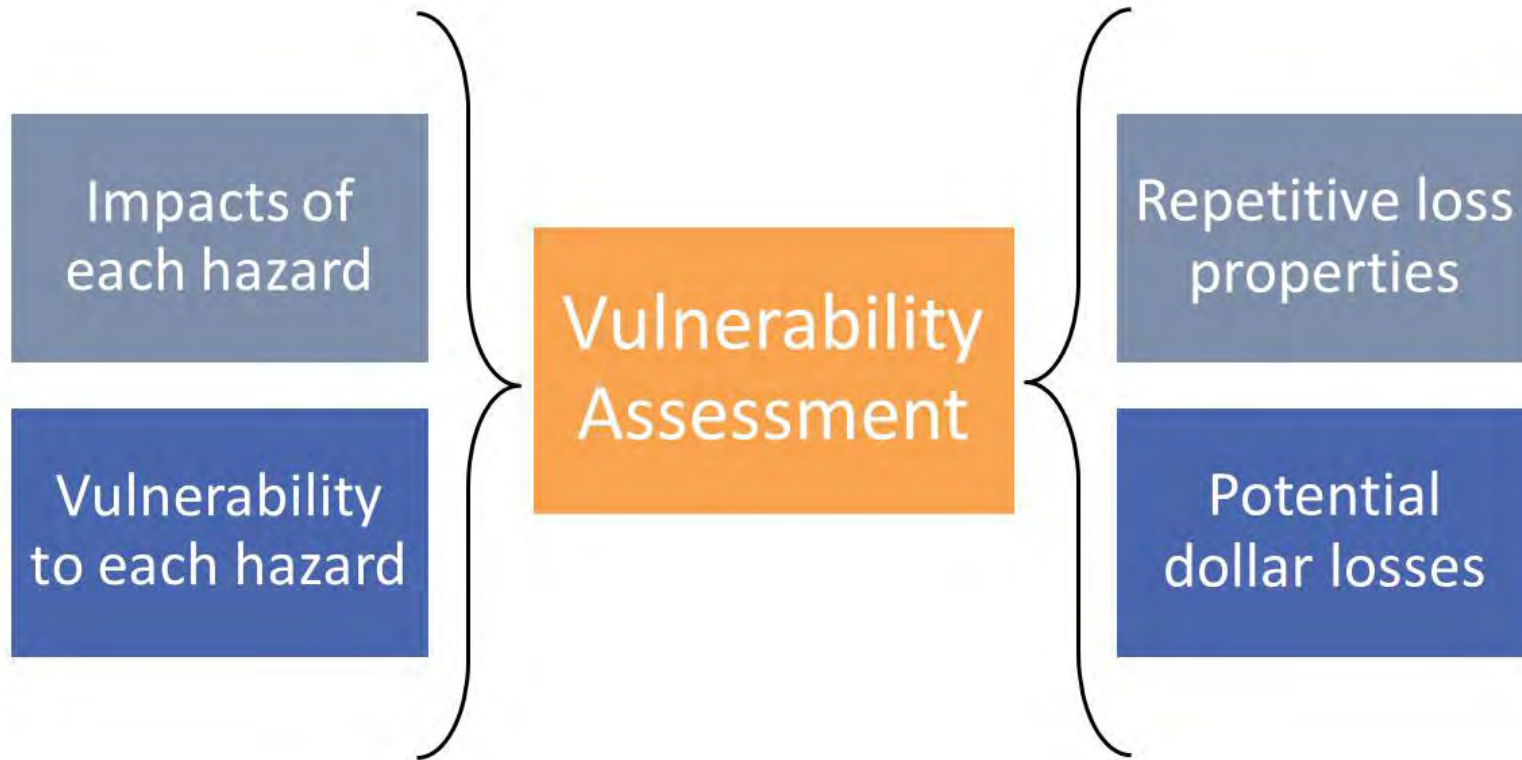
An LHMP must only look at natural hazards. Human-caused hazards may be included for the sake of improving overall community safety, but are not necessary. FEMA only provides funding to help mitigate natural hazards.

Overview of the Plan Development Process

- **Project Initiation**
 - Establish Plan Goals
 - Identify Data Needs
- **Planning Process**
 - Convene meetings with members of Hazard Mitigation Planning Committee
 - Develop Public Outreach Strategy
- **Risk Assessment**
 - Determines threat to the community
 - Gives profile of each hazard in the city
 - Examines threat to vulnerable populations



- » Describes hazards that affect community
- » Explains why some hazards are excluded



Overview of the Plan Development Process (continued)

- **Hazard Mitigation Strategy**

- Actions that Fullerton can take to reduce potential vulnerabilities consisting of:
 - Goals – Overarching objectives
 - Strategies – Comprehensive, specific actions
 - Action Plan – Ranks action by priority, cost, and timeframe

- **Plan Maintenance**

- Gives City staff tools to update Plan within 5-year time period

- **Compilation and Adoption**

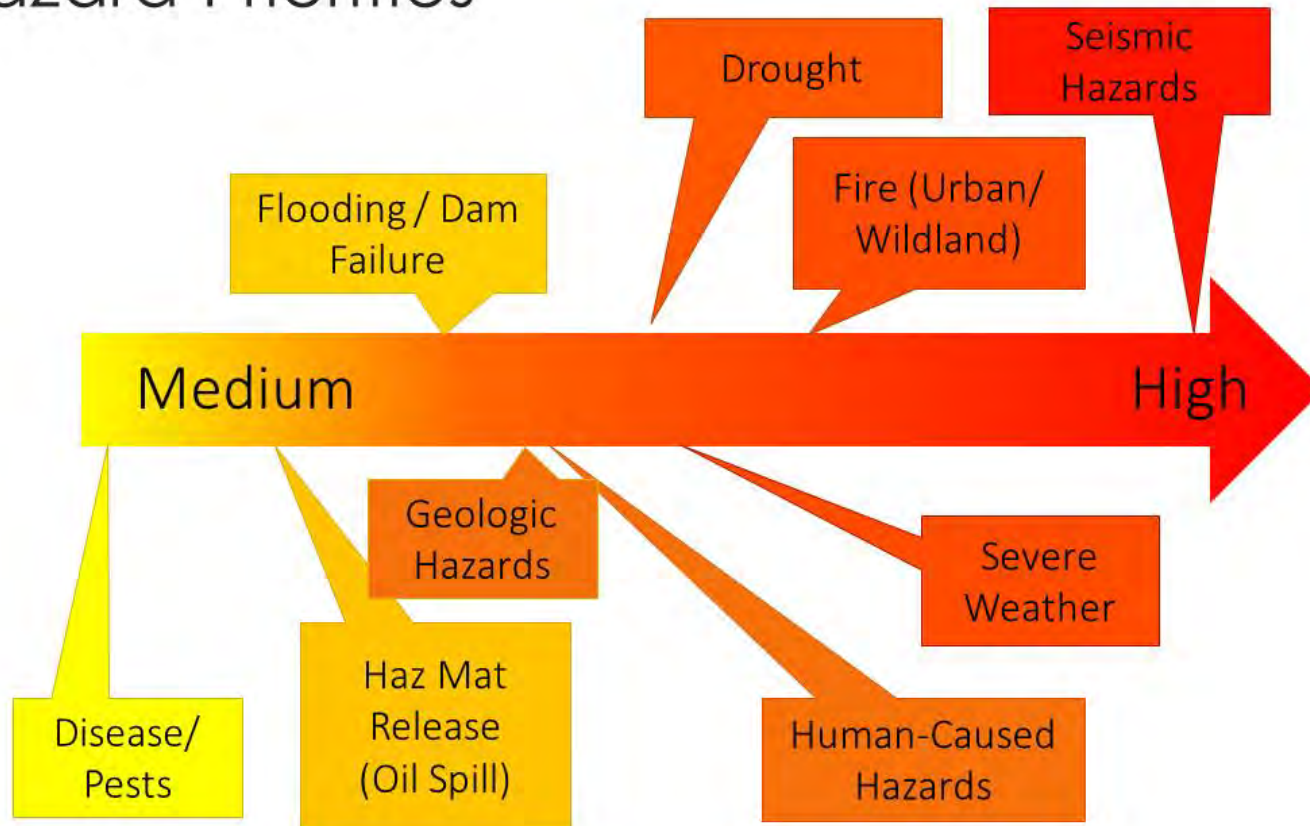
- Public review and comment
- Approval FEMA and Cal OES
- Adoption by Fullerton City Council

Hazards Addressed in Plan

- Dam Failure
- Disease/Pests
- Drought
- Fire Hazards
- Flood
- Geologic Hazards
- Hazardous Materials Release
- Human-caused Hazards
- Seismic Hazards
- Severe Weather



Hazard Priorities



Key Proposed Mitigation Actions

Dam Failure

- Feasibility investigation of an early warning alarm in case of reservoir(s) breach.

Disease and Pest Management

- Coordination with other stakeholders to provide key information on public health trends or issues, free and low-cost healthcare options, treatments, and where to find local healthcare facilities.

Drought

- Smart water meter pilot program

Mitigation Actions Drafted by HMPC



Mitigation Actions Drafted by HMPC

Human-caused Hazards

- Counterterrorism design and building materials retrofits for key City facilities.

Seismic Hazards

- Seismic retrofitting inspections for key City-designated critical facilities

Severe Weather

- Key media messaging and campaign development for future heat wave episodes, with key targeting for potential vulnerable populations.

How to Stay Engaged/Informed

Fullerton LHMP Website

<https://www.cityoffullerton.com/lhmp>

Fullerton LHMP Survey

<https://www.surveymonkey.com/r/KB6XP7D>

Public Comment or Question Period

Future Questions

If you have additional questions, please contact:

City of Fullerton

Heather Allen, Fullerton Community Development

Phone: (714) 738-6884

Email: heathera@cityoffullerton.com

PlaceWorks

Aaron Pfannenstiel, LHMP Project Manager

Phone: (909) 989-4449, extension 2201

Email: ajp@placeworks.com

Photo from Psomas

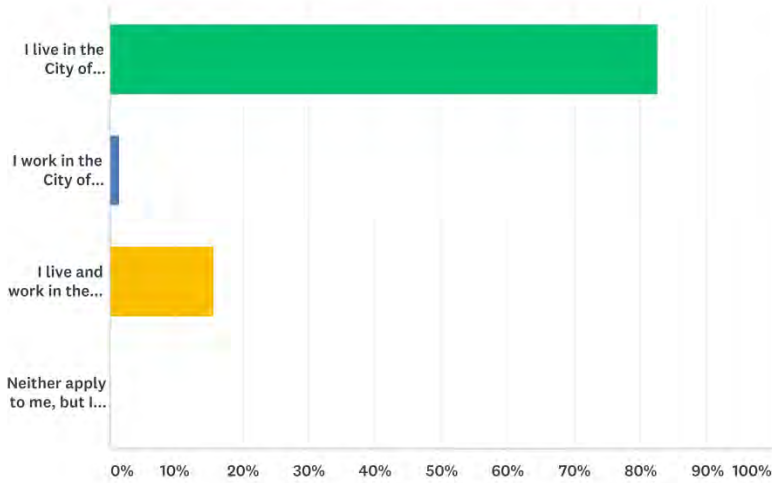
FULLERTON LHMP ONLINE SURVEY RESULTS

The survey response data is included from pages B-42 to B-82.

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q1 Please indicate whether you live or work in the City of Fullerton.

Answered: 133 Skipped: 2



ANSWER CHOICES	PERCENTAGE	RESPONSES
I live in the City of Fullerton.	82.71%	110
I work in the City of Fullerton.	1.50%	2
I live and work in the City of Fullerton.	15.79%	21
Neither apply to me, but I am interested in the City's resiliency.	0.00%	0
TOTAL		133

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q2 What is the ZIP code of your home?

Answered: 134 Skipped: 1

#	RESPONSES	DATE
1	92832	10/16/2018 12:55 PM
2	92832	10/15/2018 2:55 PM
3	92831-1916	10/15/2018 9:01 AM
4	92835	10/15/2018 7:15 AM
5	92833	10/15/2018 6:38 AM
6	92833	10/14/2018 10:23 PM
7	92832	10/14/2018 8:56 PM
8	92831	10/14/2018 8:18 PM
9	92831	10/14/2018 7:44 PM
10	92835	10/14/2018 1:15 PM
11	92835	10/14/2018 1:14 PM
12	92833	10/14/2018 9:17 AM
13	92831	10/14/2018 9:03 AM
14	92831	10/14/2018 7:10 AM
15	92833	10/13/2018 6:57 PM
16	92835	10/13/2018 10:18 AM
17	92833	10/12/2018 9:05 PM
18	92835	10/12/2018 5:35 PM
19	92831	10/12/2018 3:27 PM
20	92833	10/12/2018 2:38 PM
21	92833	10/12/2018 12:39 PM
22	92833	10/12/2018 12:07 PM
23	92833	10/12/2018 11:28 AM
24	92832	10/12/2018 11:04 AM
25	92831	10/12/2018 10:54 AM
26	92833	10/12/2018 10:41 AM
27	92835	10/12/2018 9:33 AM
28	92833	10/12/2018 8:50 AM
29	92831	10/12/2018 8:44 AM
30	92832	10/12/2018 8:09 AM
31	92835	10/12/2018 6:26 AM
32	92833	10/12/2018 5:43 AM
33	92835	10/12/2018 4:04 AM
34	92832	10/12/2018 12:50 AM
35	92835	10/12/2018 12:16 AM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

36	92833	10/11/2018 11:49 PM
37	92833	10/11/2018 10:58 PM
38	92835	10/11/2018 10:30 PM
39	92833	10/11/2018 10:21 PM
40	92831	10/11/2018 10:01 PM
41	92835	10/11/2018 9:30 PM
42	92835	10/11/2018 9:17 PM
43	92835	10/11/2018 9:13 PM
44	92835	10/11/2018 9:07 PM
45	92832	10/11/2018 8:31 PM
46	92835	10/11/2018 8:18 PM
47	92833	10/11/2018 7:54 PM
48	92835	10/11/2018 7:53 PM
49	928352	10/11/2018 7:05 PM
50	92835	10/11/2018 6:45 PM
51	92832	10/11/2018 6:41 PM
52	92835	10/11/2018 6:32 PM
53	92835	10/11/2018 6:02 PM
54	92832	10/11/2018 5:55 PM
55	92835	10/11/2018 5:54 PM
56	92832	10/11/2018 5:51 PM
57	92833	10/11/2018 5:49 PM
58	92831	10/11/2018 5:36 PM
59	92833	10/11/2018 5:25 PM
60	92831	10/11/2018 5:24 PM
61	92831	10/11/2018 5:15 PM
62	92832	10/11/2018 5:07 PM
63	92833	10/11/2018 5:03 PM
64	92833	10/11/2018 4:55 PM
65	92833	10/11/2018 4:51 PM
66	92831	10/11/2018 4:46 PM
67	92833	10/11/2018 4:26 PM
68	92833	10/11/2018 4:16 PM
69	92833-3117	10/11/2018 4:15 PM
70	92833	10/11/2018 4:03 PM
71	92835	10/11/2018 4:03 PM
72	92835	10/11/2018 4:00 PM
73	92835	10/11/2018 3:51 PM
74	92833	10/11/2018 3:49 PM
75	92833	10/11/2018 3:48 PM
76	92833	10/11/2018 3:43 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

77	92835	10/11/2018 3:38 PM
78	92831	10/11/2018 3:38 PM
79	90603	10/11/2018 3:36 PM
80	92831	10/11/2018 3:21 PM
81	92831	10/11/2018 3:19 PM
82	92833	10/11/2018 3:19 PM
83	92831	10/11/2018 3:09 PM
84	92833	10/11/2018 3:07 PM
85	92833	10/11/2018 3:06 PM
86	92835	10/11/2018 3:05 PM
87	92835	10/11/2018 3:01 PM
88	92835	10/11/2018 2:59 PM
89	92831	10/11/2018 2:56 PM
90	92831	10/11/2018 2:52 PM
91	92832	10/11/2018 2:51 PM
92	92835	10/11/2018 2:50 PM
93	92832	10/11/2018 2:46 PM
94	92832	10/11/2018 2:45 PM
95	92835	10/11/2018 2:44 PM
96	92833	10/11/2018 2:42 PM
97	92831	10/11/2018 2:41 PM
98	92831	10/11/2018 2:38 PM
99	92833	10/11/2018 2:36 PM
100	92833	10/11/2018 2:32 PM
101	92835	10/11/2018 2:30 PM
102	92835	10/11/2018 2:27 PM
103	92831	10/11/2018 2:26 PM
104	92835	10/11/2018 2:26 PM
105	92835	10/11/2018 2:25 PM
106	92833	10/11/2018 2:21 PM
107	92831	10/11/2018 2:21 PM
108	92832	10/11/2018 2:21 PM
109	92832	10/11/2018 2:21 PM
110	92831	10/11/2018 2:16 PM
111	92831	10/11/2018 2:16 PM
112	92831	10/11/2018 2:15 PM
113	92831	10/11/2018 2:12 PM
114	92835-2245	10/11/2018 2:11 PM
115	92835	10/11/2018 2:11 PM
116	92832	10/11/2018 2:09 PM
117	92835	10/11/2018 2:06 PM

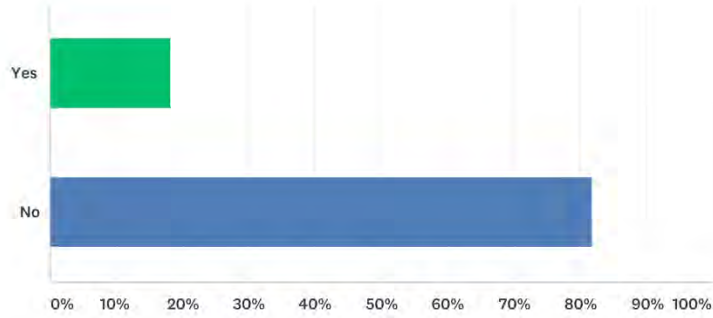
Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

118	92832	10/11/2018 2:04 PM
119	92832	10/11/2018 2:00 PM
120	92831	10/11/2018 11:53 AM
121	92833-1849	10/11/2018 10:39 AM
122	92833	10/11/2018 10:19 AM
123	92831	10/11/2018 9:44 AM
124	92832	10/11/2018 9:29 AM
125	92832	10/11/2018 9:01 AM
126	92832	10/11/2018 8:34 AM
127	92833	10/3/2018 1:36 PM
128	91709	10/2/2018 10:37 AM
129	92831	9/27/2018 9:46 PM
130	92832	9/17/2018 7:49 AM
131	92833	9/16/2018 10:06 AM
132	92835	8/30/2018 12:24 AM
133	92833	8/28/2018 8:17 PM
134	92832	8/28/2018 5:21 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q3 Have you been impacted by a disaster in your current residence?

Answered: 132 Skipped: 3

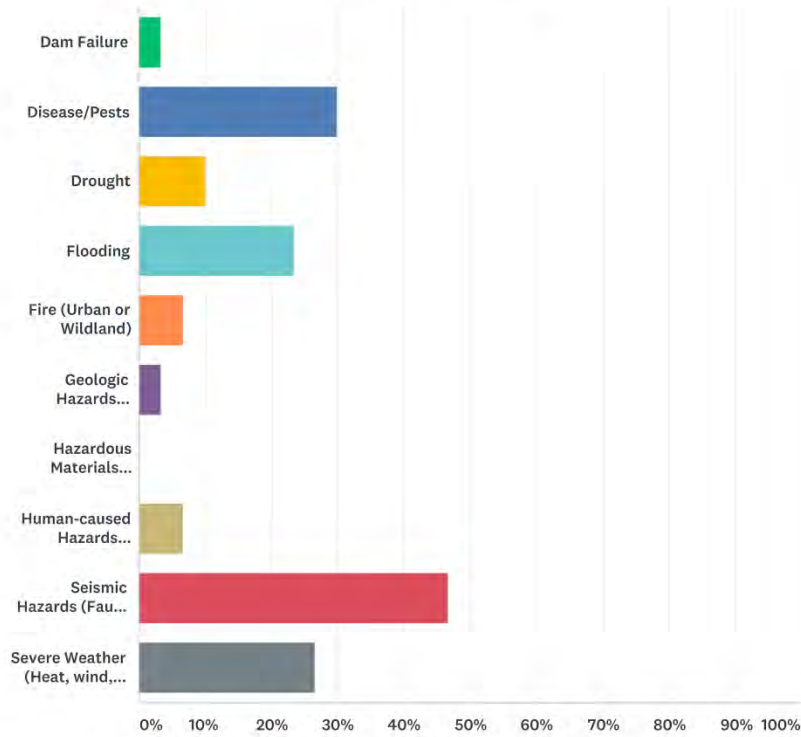


ANSWER CHOICES	RESPONSES	
Yes	18.18%	24
No	81.82%	108
TOTAL		132

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q4 If you answered yes to the previous question, please select the type of disaster that you have been impacted by (select all that apply).

Answered: 30 Skipped: 105



ANSWER CHOICES	RESPONSES
Dam Failure	3.33% 1
Disease/Pests	30.00% 9
Drought	10.00% 3
Flooding	23.33% 7
Fire (Urban or Wildland)	6.67% 2
Geologic Hazards (Landslides, Mudflows, Subsidence)	3.33% 1
Hazardous Materials Release (Oil spills)	0.00% 0
Human-caused Hazards (Aircraft, civil disturbance, transportation accidents, terrorism, cyber threats, etc.)	6.67% 2
Seismic Hazards (Fault rupture, seismic shaking, liquefaction)	46.67% 14
Severe Weather (Heat, wind, rain)	26.67% 8

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

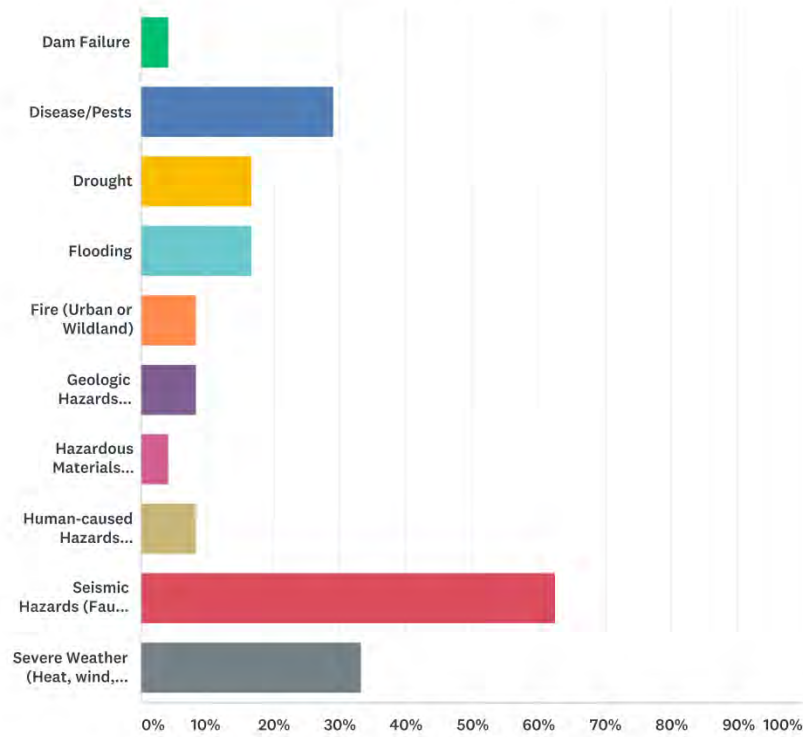
Total Respondents: 30

#	PLEASE LIST ANY ADDITIONAL HAZARDS THAT HAVE PREVIOUSLY IMPACTED YOUR NEIGHBORHOOD OR HOME.	DATE
1	.	10/13/2018 10:18 AM
2	Previously had a rodent problem prior to moving into our home. But we hired a pest control company to close all the entry points, sterilize our attic, and place new insulation.	10/12/2018 12:07 PM
3	With any amount of rain my street floods over the curb in from of my house. I wouldn't call it a disaster but it could get worse.	10/12/2018 9:33 AM
4	Rats. One year, I believe it was 1998, the yard and patio flooded up to the first step on the steps to the. Since there are only two steps this was pretty scary Also I have tripped and fallen due to potholes on city streets. Potholes are also a hazard for cars	10/12/2018 4:04 AM
5	Freeway noise and grime. Trash and misc from homeless encampments.	10/11/2018 5:07 PM
6	geologic hazard brought on by drought. have also experienced earthquakes and heavy rains	10/11/2018 2:11 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q5 If you answered yes to the previous question, please select the type of disaster that you have been impacted by (select all that apply).

Answered: 24 Skipped: 111



ANSWER CHOICES	RESPONSES
Dam Failure	4.17% 1
Disease/Pests	29.17% 7
Drought	16.67% 4
Flooding	16.67% 4
Fire (Urban or Wildland)	8.33% 2
Geologic Hazards (Landslides, Mudflows, Subsidence)	8.33% 2
Hazardous Materials Release (Oil spills)	4.17% 1
Human-caused Hazards (Aircraft, civil disturbance, transportation accidents, terrorism, cyber threats, etc.)	8.33% 2
Seismic Hazards (Fault rupture, seismic shaking, liquefaction)	62.50% 15
Severe Weather (Heat, wind, rain)	33.33% 8

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

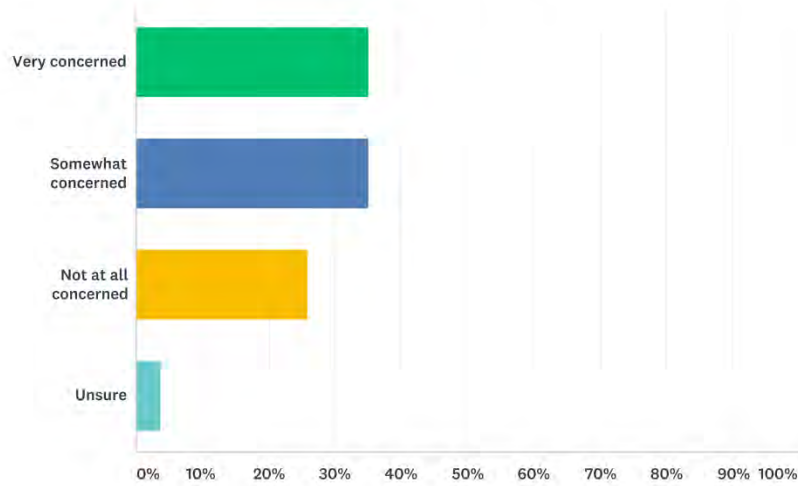
Total Respondents: 24

#	PLEASE LIST ANY ADDITIONAL HAZARDS THAT PRESENT A THREAT TO YOUR NEIGHBORHOOD OR HOME.	DATE
1	-	10/13/2018 10:18 AM
2	Back slope could slide	10/12/2018 4:04 AM
3	Pathogens allowed to fester in homeless encampments.	10/11/2018 2:46 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q6 How concerned are you that climate change may create new hazardous situations in Fullerton, or make existing natural hazards worse?

Answered: 131 Skipped: 4

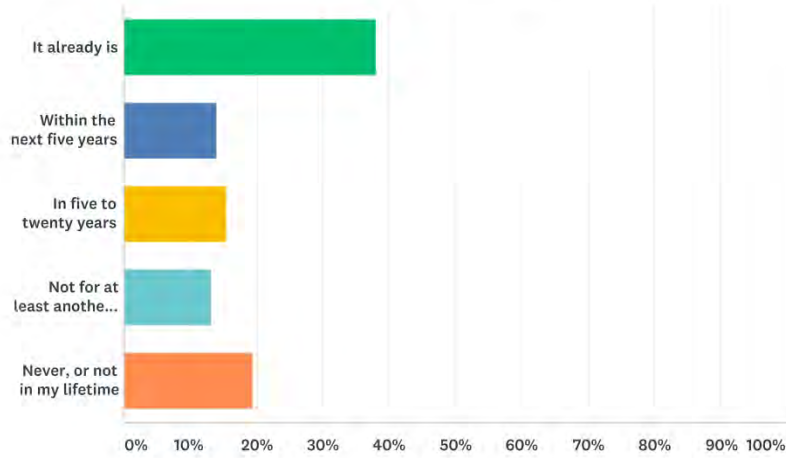


ANSWER CHOICES	RESPONSES	
Very concerned	35.11%	46
Somewhat concerned	35.11%	46
Not at all concerned	25.95%	34
Unsure	3.82%	5
TOTAL		131

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q7 When do you think climate change will pose a threat to your health, property, livelihood, or overall well-being?

Answered: 129 Skipped: 6

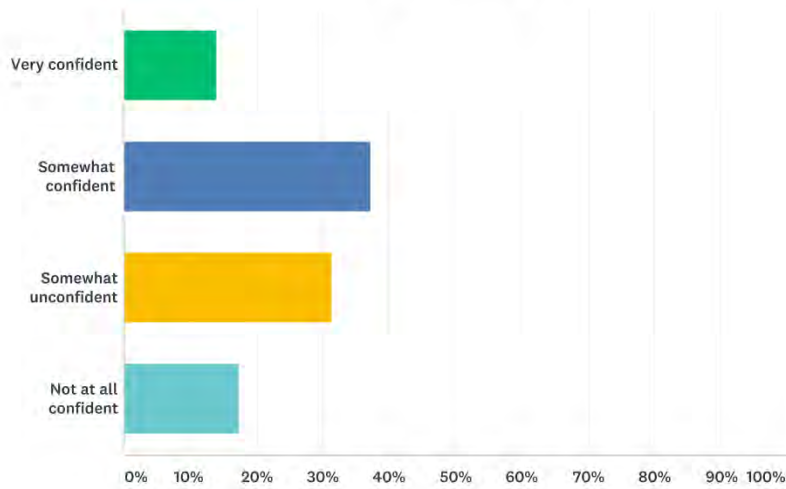


ANSWER CHOICES	RESPONSES	
It already is	37.98%	49
Within the next five years	13.95%	18
In five to twenty years	15.50%	20
Not for at least another twenty years	13.18%	17
Never, or not in my lifetime	19.38%	25
TOTAL		129

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q8 If you have taken any action to protect yourself against natural hazards, how confident are you that these actions will be sufficient to protect against more severe hazards that are expected because of climate change?

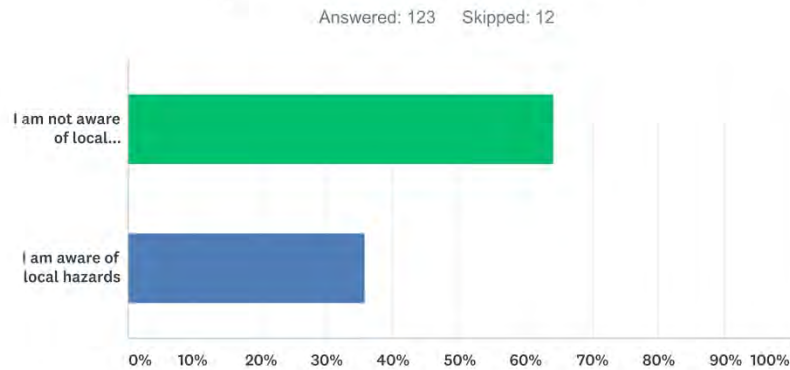
Answered: 121 Skipped: 14



ANSWER CHOICES	RESPONSES	
Very confident	14.05%	17
Somewhat confident	37.19%	45
Somewhat unconfident	31.40%	38
Not at all confident	17.36%	21
TOTAL		121

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q9 The planning team is using various data sources to identify hazards in your community; however, some of these data sources do not provide data at a general citywide level. Are there any small-scale issues, such as ponding at a certain intersection during rain, that you would like the planning team to consider?



ANSWER CHOICES	RESPONSES	
I am not aware of local hazards	64.23%	79
I am aware of local hazards	35.77%	44
TOTAL		123

#	PLEASE PROVIDE AS MUCH DETAIL AS POSSIBLE, INCLUDING LOCATION AND TYPE OF HAZARD.	DATE
1	Ponding along Orangethorpe.	10/16/2018 12:55 PM
2	The intersection of Raymond and Orangethorpe always accumulates a dangerous amount of water during heavy rains. In addition, Dorothy Avenue between Raymond and Acacia pools water across the width of the street.	10/15/2018 9:01 AM
3	Homeless people loitering panhandling toileting in public are health and safety hazards throughout the city.	10/14/2018 10:23 PM
4	why do you have the emergency command center right next to a CNG fueling center, a few feet from your own yard gas station, and adjacent to rail lines that are frequently used by tanker cars? it seems a recipe for disaster during a catastrophic earthquake	10/14/2018 8:56 PM
5	Drainage issues in heavy rains.	10/14/2018 1:15 PM
6	Malvern Creek has a chain-link fence on both sides intended to keep the water in during a flood. The only thing that will keep water in is cinder block walls.	10/14/2018 9:17 AM
7	I would like to see rain water diverted into some bioswales. Intersection of Yale and Brookdale gets flooded	10/14/2018 7:10 AM
8	Stock piling of potentially hazardous items, spray cans, pesticides	10/12/2018 2:38 PM
9	The Robert E. Ward nature preserve has a lot of brush which would readily burn if there was ever a wildfire there. The idea of controlled burning seems like it can be applied at the Robert E. Ward nature preserve. There are many homes surrounding this area that are at extremely high risk of damage if there was ever a wildfire.	10/12/2018 12:07 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

10	Arroyo Pl. floods during heavy rains, it would be impossible to use this street for any evacuations.	10/12/2018 8:50 AM
11	Coyote Hills Park has areas where water runoff from sprinklers pools on the sodewalks, potentially leading to breeding ground for mosquitos	10/12/2018 5:43 AM
12	Commonwealth floods during heavy rains; from richman to Euclid. Potholes will continue to be an increasinghazard since they are not being addressed.	10/12/2018 4:04 AM
13	Associated Road was designated as a flood channel in severe rain or dam failure. This is why there is only a tennis court at the corner of Associated Road and Bastanchury. This is why there is only a small farm south of Imperial Hwy. I have wondered for years why condos were built below the street level at the southwest corner of Bastanchury and Associated Rd.	10/11/2018 9:30 PM
14	Fullerton roads are slurried but the crappy job and sub par materials crack and deteriorate within 2 years. Why aren't we hiring a company that can do it right, dig it out and level it properly?	10/11/2018 7:54 PM
15	We are near the oil fields in NE Fullerton. Have flooding on 1500 block of Evergreen when it rains.	10/11/2018 7:05 PM
16	Puddling because of damaged curb from water main break on rosarita. Poor roads thru out the city. Danger for cars and emergency vehicles.	10/11/2018 6:32 PM
17	Chapman at Truman Ave often has standing water.	10/11/2018 5:55 PM
18	Potholes...all over Fullerton.	10/11/2018 5:54 PM
19	Excessive speeding on neighborhood streets- Woods Ave, between Commonwealth & Chapman, large potholes that are damaging cars, overgrown trees that create damage to sidewalks and streets and block signs.	10/11/2018 5:51 PM
20	Harbor blvd floods from la Palma north. Nearly impassable during heavy rains	10/11/2018 5:36 PM
21	Flooding on Brookhurst from Orangethorpe to the 91 with heavy rain	10/11/2018 5:25 PM
22	We have sightings of coyotes in our area very frequently.	10/11/2018 4:55 PM
23	There is an ongoing standing water problem at the southern intersection of Loma Alta and Canyon. There was some repair done a while back that reduced the standing water but the problem is not resolved. This is a problem for both ponding during rain and potentially mosquito breeding.	10/11/2018 4:51 PM
24	Given the current mosquito infestation, the water at the NE corner of the housing block sits for several days after a rain.	10/11/2018 4:26 PM
25	Low spot at little Chapman and Wayne Ave. has ponding nearly every time it rains.	10/11/2018 4:16 PM
26	BASQUE AND CHAPMAN AREA FLOODS AT HEAVY RAIN	10/11/2018 3:48 PM
27	Sweet at Amerige seems to always have sitting water.	10/11/2018 3:43 PM
28	Corner of Page/ Roberta and Brookhurst severe flooding . Also the corner of Brookhurst and orangethorp in adequate drainage .	10/11/2018 3:25 PM
29	Poor drainage exists in the neighborhood between Malvern, Euclid, Commonwealth and Basque.	10/11/2018 3:19 PM
30	Camps at the train station, along the abandoned railroad, under freeway overpasses.	10/11/2018 2:46 PM
31	Standing water in the curbs encourage mosquitos. We are getting eaten alive. I don't have standing water anywhere on my property but I can't do anything about standing water in improperly graded curbs.	10/11/2018 2:45 PM
32	In heavy rains our street gets flooded with rain and mud from the hills above. The water has risen over the curb onto the grass.	10/11/2018 2:41 PM
33	This may not be what you're looking for but some of the intersections in my neighborhood do not have stop signs either way and at least one of the directions of the intersection should have yield signs. My address is 1431 W. Woodcrest Ave. During heavy rains several of the intersections in my neighborhood turns upon particularly Woodcrest and Basque	10/11/2018 2:36 PM
34	Brookhurst and the 91 freeway. Caltrans has all rainfall and drains from the city of Anaheim going to the Houston channel on the Fullerton side. And the drains from the 91 freeway. Causes backup and flooding.	10/11/2018 2:32 PM
35	Orangthorpe and Raymond	10/11/2018 2:21 PM

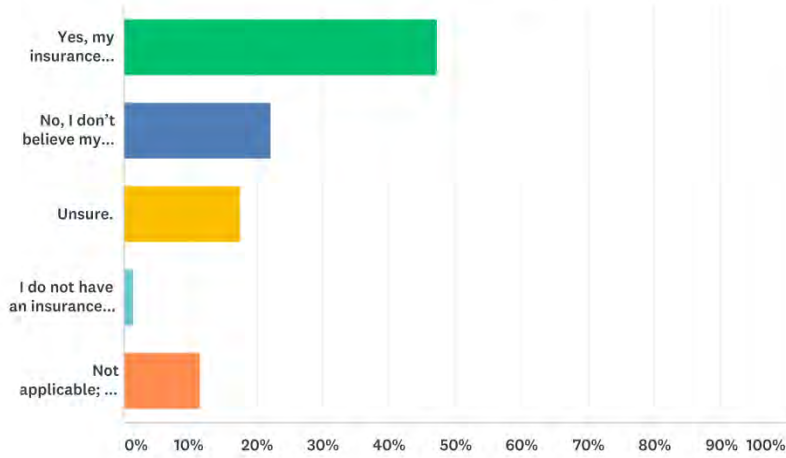
Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

36	I have a storm drain in front of my house and I removed a huge tree in my front yard that could of poised a threat to my house and safety of others	10/11/2018 2:21 PM
37	There is a gutter/drain at the end of Longview Drive as it curves around towards Brea Blvd that is always clogged with mud and debris.	10/11/2018 2:12 PM
38	subsidence due to drought; sinking foundations	10/11/2018 2:11 PM
39	Area off of Berkeley gets flooded. See this youtube video for evidence. https://www.youtube.com/watch?v=IrGxnYIae-o	10/11/2018 2:09 PM
40	The potholes everywhere are fairly hazardous to bicycle riders especially, and also damaging to cars.	10/11/2018 2:04 PM
41	Condition of roads. They a are a danger to drivers and people alike.	10/11/2018 10:39 AM
42	In the neighborhood where Julie Ave is, near Basque, there has been flooding higher than the muffler of my car.	8/30/2018 12:24 AM
43	Aggressive drivers increasingly running red lights at intersections	8/28/2018 8:17 PM
44	The railroad underpass on Harbor south of Commonwealth is prone to flooding	8/28/2018 5:21 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q10 If you are a homeowner, do you have adequate homeowners' insurance to cover the hazards that could impact your home?

Answered: 131 Skipped: 4

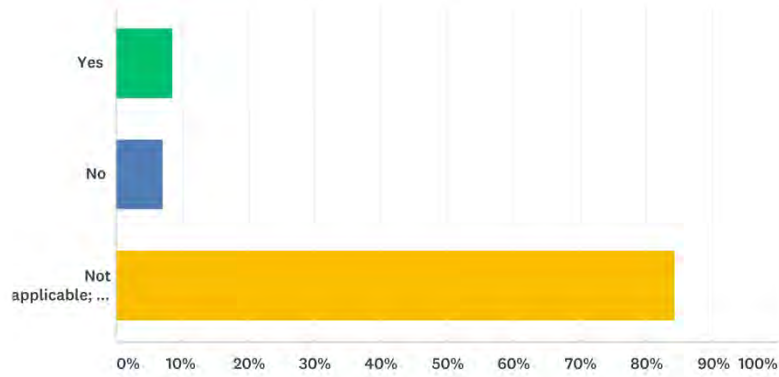


ANSWER CHOICES	RESPONSES	
Yes, my insurance coverage should be adequate.	47.33%	62
No, I don't believe my insurance coverage would be adequate for a major disaster.	22.14%	29
Unsure.	17.56%	23
I do not have an insurance policy.	1.53%	2
Not applicable; I rent my current residence.	11.45%	15
TOTAL		131

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q11 If you rent your residence, do you have renters' insurance?

Answered: 127 Skipped: 8

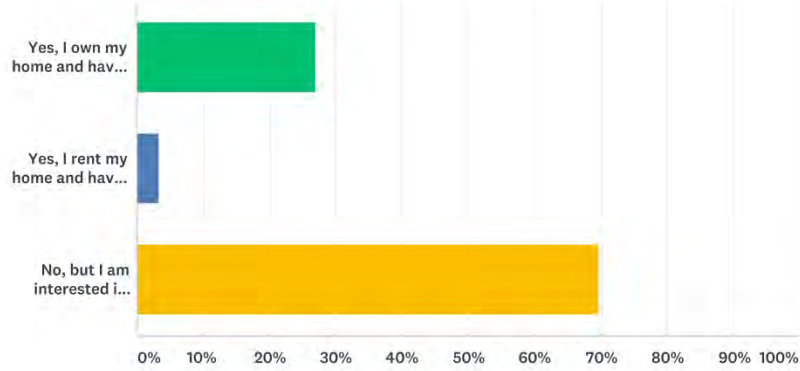


ANSWER CHOICES	RESPONSES	
Yes	8.66%	11
No	7.09%	9
Not applicable; I own my residence.	84.25%	107
TOTAL		127

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q12 Do you have flood insurance for your home?

Answered: 119 Skipped: 16

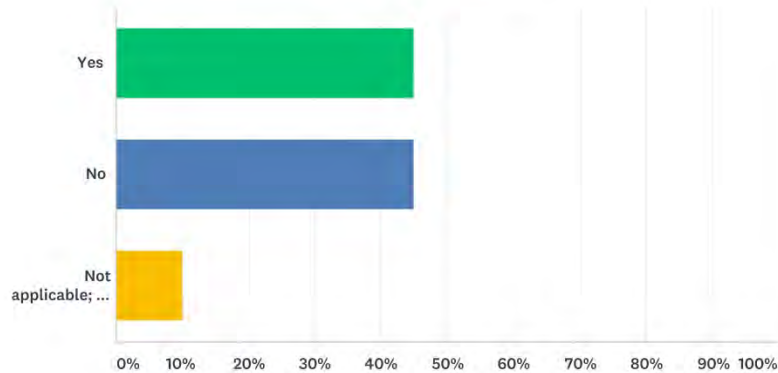


ANSWER CHOICES	RESPONSES
Yes, I own my home and have flood insurance.	26.89% 32
Yes, I rent my home and have flood insurance.	3.36% 4
No, but I am interested in reviewing flood insurance options (https://www.floodsmart.gov/).	69.75% 83
TOTAL	119

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q13 Have you done anything to your home to make it less vulnerable to hazards such as earthquakes, floods, and fires?

Answered: 129 Skipped: 6



ANSWER CHOICES	RESPONSES
Yes	44.96% 58
No	44.96% 58
Not applicable; I rent my residence.	10.08% 13
TOTAL	129

#	IF NOT, DO YOU PLAN TO?	DATE
1	Yes. Replace turn with stormwater capture drought tolerante landscape.	10/16/2018 12:55 PM
2	Not sure what needs to be done	10/15/2018 7:15 AM
3	i plan to continually upgrade my preparations as well as swapping out items by code date	10/14/2018 8:56 PM
4	I live in a condominium, the HOA deals with the buildings and environs.	10/14/2018 7:44 PM
5	Replaced our shake roof with a tile roof.	10/14/2018 1:15 PM
6	I'm thinking about having some work done to secure it in case of an earthquake	10/14/2018 7:10 AM
7	No	10/12/2018 5:35 PM
8	Our house is in code for earthquakes, we sit above flood plains, Fires, our property is surrounded by trees and brush from others properties. Not much we can do.	10/12/2018 8:50 AM
9	I'd like to, but my father owns the home and will not take the needed actions.	10/11/2018 11:49 PM
10	Not sure how	10/11/2018 10:30 PM
11	If not too cost prohibitive	10/11/2018 10:01 PM
12	Our homeowners association has taken measures to install drains where water flows downhill directly towards homes. This helps with rainfall.	10/11/2018 9:30 PM
13	Not sure what to do.	10/11/2018 5:55 PM
14	Not really sure how to	10/11/2018 5:49 PM
15	I don't know what to do.	10/11/2018 4:16 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

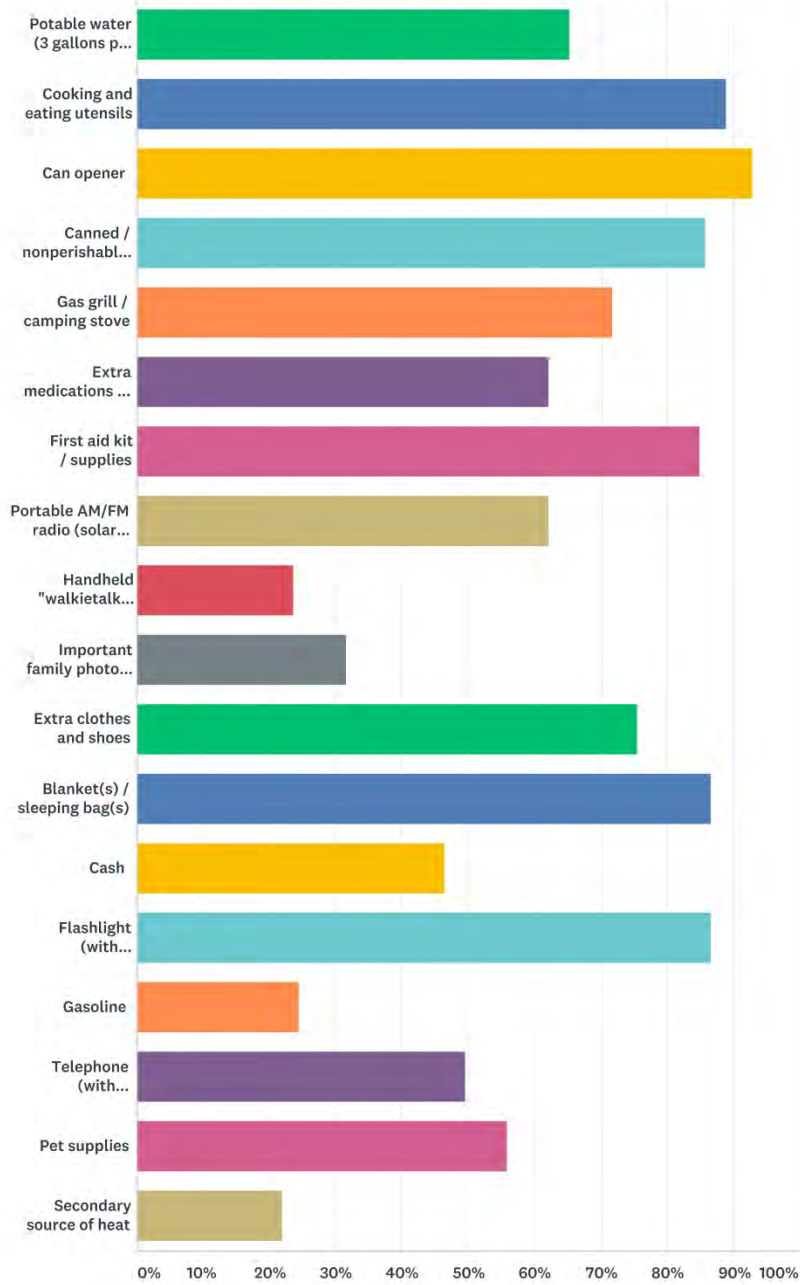
16	Yes, once a specific hazard is identified.	10/11/2018 2:59 PM
17	maybe	10/11/2018 2:46 PM
18	not in the budget	10/11/2018 2:41 PM
19	About as much as the people in hurricane areas	10/11/2018 2:32 PM
20	BRACE/BOLT FOUNDATION	10/11/2018 2:16 PM
21	No	8/28/2018 8:17 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q14 If a severe hazard event occurred today such that all services were cut off from your home (power, gas, water, sewer) and you were unable to leave or access a store for 72 hours, which of these items do you have readily available?

Answered: 127 Skipped: 8

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey



ANSWER CHOICES	RESPONSES
Potable water (3 gallons per person)	65.35% 83

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Cooking and eating utensils	88.98%	113
Can opener	92.91%	118
Canned / nonperishable foods (ready to eat)	85.83%	109
Gas grill / camping stove	71.65%	91
Extra medications and contact lenses (if applicable)	62.20%	79
First aid kit / supplies	85.04%	108
Portable AM/FM radio (solar powered, hand crank, or batteries)	62.20%	79
Handheld "walkietalkie" radios (with batteries)	23.62%	30
Important family photos / documentation in a water- and fireproof container	31.50%	40
Extra clothes and shoes	75.59%	96
Blanket(s) / sleeping bag(s)	86.61%	110
Cash	46.46%	59
Flashlight (with batteries)	86.61%	110
Gasoline	24.41%	31
Telephone (with batteries)	49.61%	63
Pet supplies	55.91%	71
Secondary source of heat	22.05%	28
Total Respondents: 127		

#	WHAT ELSE DO YOU HAVE IN YOUR EMERGENCY KIT?	DATE
1	gloves, shovel, axe, pry bars, etc	10/14/2018 8:56 PM
2	bottle of soap, butane lighter and 100 \$1 bills because no one will have change for a 20.	10/14/2018 9:17 AM
3	Tent, eyeglasses, kitty litter and trash bags (for latrine), a vegetable garden	10/13/2018 10:18 AM
4	Portable generator	10/12/2018 10:41 AM
5	3 season tent	10/12/2018 8:50 AM
6	Basic tools	10/12/2018 8:09 AM
7	Tools (shovels, rakes, rope, tarps, large containers) Batteries, generator, solar powered items, water purifier, disinfectant, personal hygiene supplies	10/12/2018 6:26 AM
8	Wrench for gas line, gloves, limited water.	10/11/2018 11:49 PM
9	Solar phone charger	10/11/2018 10:30 PM
10	Pop-up tent. Portable toilet. Emergency food.	10/11/2018 9:30 PM
11	Generator, CERT kit, emergency lights in house, Trash bags, pop up canopy, plastic tarps, Lightsticks,etc...	10/11/2018 7:05 PM
12	Potable water	10/11/2018 6:45 PM
13	I could survive for 72 hours inside my home. However, the following items are not collectively in one place in my home but, maybe should be -tools to turn off gas, water, power (should there be broken pipes or leaks) -out-of-the-area contact information (for cell phone) so people don't worry - hurricane lamps for light in the evening (oil) -toilet paper -poncho (re: rain) -camera (for assessment) -given the way medications are dispensed, having extra medication is ONLY good in theory.	10/11/2018 4:26 PM
14	Gun and ammo, local area map, CB /Ham radio.	10/11/2018 3:25 PM

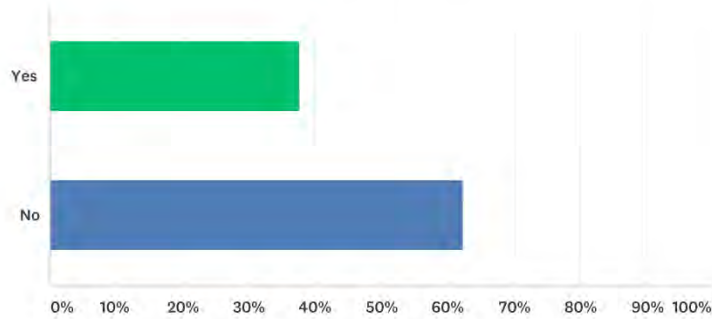
Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

15	Nothing.	10/11/2018 3:06 PM
16	Water filtration kit, MREs, solar panels, personal security,	10/11/2018 3:01 PM
17	Tools	10/11/2018 2:30 PM
18	Small toolkit, matches, toothpaste and brushes,mylar blanket, signal mirror, gas mask and nbc filters, lots of stuff	10/11/2018 2:27 PM
19	Jesus	10/11/2018 2:21 PM
20	an entire motorhome	10/11/2018 9:44 AM
21	Generator, camping supplies, RV,	9/17/2018 7:49 AM
22	Hair ties Hiking shoes & socks Sunscreen Vaseline Compass Hand sanitizer	9/16/2018 10:06 AM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q15 Are you familiar with the special needs of your neighbors in the event of a disaster situation (special needs may include limited mobility, severe medical conditions, memory impairments)?

Answered: 130 Skipped: 5

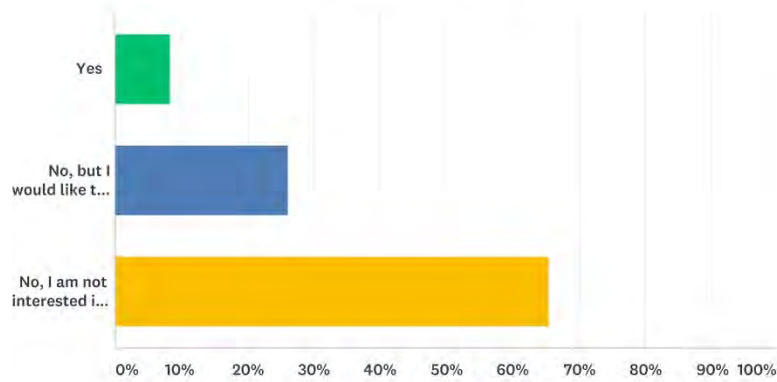


ANSWER CHOICES	RESPONSES	
Yes	37.69%	49
No	62.31%	81
TOTAL		130

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q16 Are you a trained member of your Community Emergency Response Team (CERT)?

Answered: 130 Skipped: 5

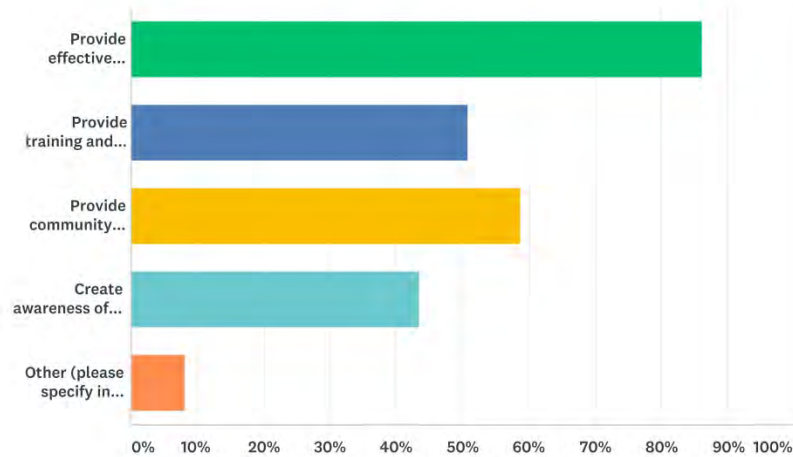


ANSWER CHOICES	RESPONSES	
Yes	8.46%	11
No, but I would like to learn more about CERT.	26.15%	34
No, I am not interested in being a trained CERT member.	65.38%	85
TOTAL		130

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q17 How can the City help you become better prepared for a disaster?
(choose all that apply)

Answered: 124 Skipped: 11



ANSWER CHOICES	RESPONSES
Provide effective emergency notifications and communication.	86.29% 107
Provide training and education to residents and business owners on how to reduce future damage.	50.81% 63
Provide community outreach regarding emergency preparedness.	58.87% 73
Create awareness of special needs and vulnerable populations.	43.55% 54
Other (please specify in comment box below)	8.06% 10
Total Respondents: 124	

#	IF YOU SELECTED "OTHER" PLEASE SPECIFY HERE:	DATE
1	Assess neighborhood	10/15/2018 7:15 AM
2	intermediate and advanced first aid, and emergency techniques and strategies for residence	10/14/2018 8:56 PM
3	I am worried about roads becoming impassible. I would like to see the city set up a plan to mobilize crews to patch and repair roads or remove large pieces of asphalt that break off and prevent us from driving IMMEDIATELY after a disaster instead of waiting for weeks until you get around to it. If we have a really bad disaster, people need to leave IMMEDIATELY after in order to save lives. Please take this seriously. Up to 3,000 people died in Puerto Rico because they couldn't escape. The original death toll was around 50. Learn from other people's mistakes.	10/14/2018 9:17 AM
4	we have signed up for the Fullerton Emergency Notification System and received our test notice.	10/11/2018 9:30 PM
5	Know where our board & care homes are in our neighborhoods. CERT used to have districts for local response with district leaders	10/11/2018 7:05 PM
6	Create a system so fire and Pd are aware of homes where people with special needs live	10/11/2018 5:36 PM
7	Provide low or no cost lows for people to improve their seismic readiness both structurally as well as in home readiness such as strapping large items and fastening cabinets.	10/11/2018 4:51 PM
8	Provide some items for kit. Cant afford to stockpile	10/11/2018 4:15 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

9	notification if in a flood or special hazard zone	10/11/2018 4:00 PM
10	Ask the Health Dept to test for biohazards in the encampments then clean them up.	10/11/2018 2:46 PM
11	Make people aware of how serious disasters are. None of my neighbors are prepared. I can't prep for the whole block. I am prepped long term for my family, but if I have to provide for my neighbors too, none of us will have enough.	10/11/2018 2:45 PM
12	email links to websites	10/11/2018 2:41 PM
13	apply for FEMA HMA grants to help homeowners take action.	10/11/2018 2:11 PM
14	Permanent supportive housing for our vulnerable disabled homeless population.	10/11/2018 2:04 PM
15	Maintain city infrastructure: roads, storm drains	10/3/2018 1:36 PM
16	Provide supplies.	9/16/2018 10:06 AM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q18 What is the ZIP code of your workplace?

Answered: 47 Skipped: 88

#	RESPONSES	DATE
1	92831	10/16/2018 12:55 PM
2	92806	10/14/2018 10:23 PM
3	retired	10/14/2018 8:56 PM
4	92831	10/14/2018 7:44 PM
5	Retired	10/14/2018 1:15 PM
6	92886	10/14/2018 1:14 PM
7	91765	10/14/2018 9:03 AM
8	92831	10/12/2018 3:27 PM
9	92833	10/12/2018 2:38 PM
10	92832	10/12/2018 11:04 AM
11	N/A	10/12/2018 10:54 AM
12	92832	10/11/2018 10:21 PM
13	92832	10/11/2018 8:31 PM
14	92832	10/11/2018 7:54 PM
15	92832	10/11/2018 7:53 PM
16	92833	10/11/2018 6:32 PM
17	92833	10/11/2018 5:25 PM
18	92831	10/11/2018 5:24 PM
19	92833	10/11/2018 4:16 PM
20	92831	10/11/2018 4:03 PM
21	92831	10/11/2018 4:00 PM
22	92835	10/11/2018 3:51 PM
23	92831	10/11/2018 3:49 PM
24	92833	10/11/2018 3:48 PM
25	90027	10/11/2018 3:38 PM
26	92832	10/11/2018 3:19 PM
27	92831	10/11/2018 3:09 PM
28	92835	10/11/2018 2:56 PM
29	90017	10/11/2018 2:46 PM
30	92833	10/11/2018 2:36 PM
31	90744	10/11/2018 2:32 PM
32	92831	10/11/2018 2:27 PM
33	92831	10/11/2018 2:26 PM
34	All of fullerton	10/11/2018 2:26 PM
35	92835	10/11/2018 2:25 PM

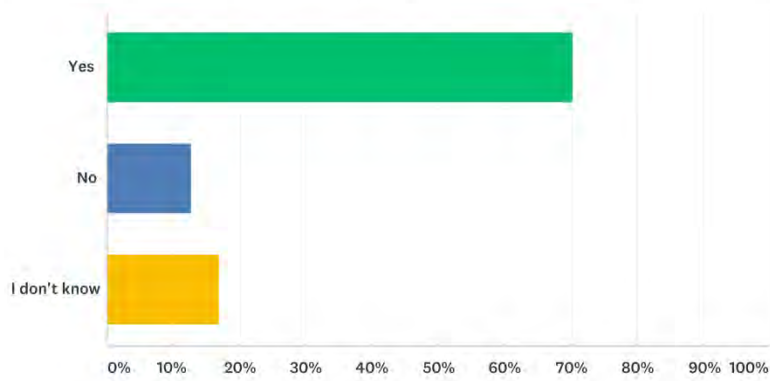
Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

36	92831	10/11/2018 2:21 PM
37	92831	10/11/2018 2:21 PM
38	92835-2245	10/11/2018 2:11 PM
39	92832	10/11/2018 2:04 PM
40	92832	10/11/2018 2:00 PM
41	92832	10/11/2018 10:19 AM
42	92833	10/11/2018 9:44 AM
43	9	10/11/2018 9:29 AM
44	92832	10/11/2018 8:34 AM
45	92832	10/2/2018 10:37 AM
46	92831	9/27/2018 9:46 PM
47	92832	8/28/2018 5:21 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q19 Does your employer have a plan for disaster recovery in place?

Answered: 47 Skipped: 88

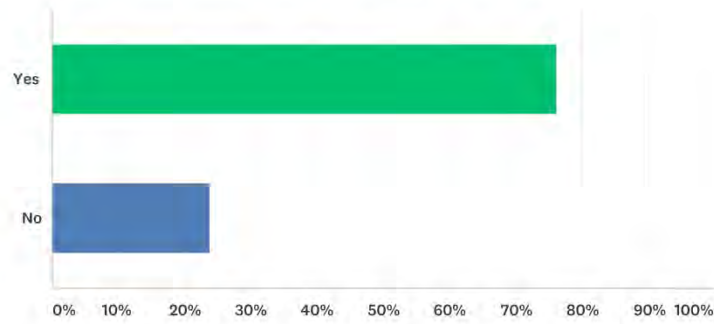


ANSWER CHOICES	RESPONSES	
Yes	70.21%	33
No	12.77%	6
I don't know	17.02%	8
TOTAL		47

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q20 Does your employer have a workforce communications plan to implement following a disaster so they are able to contact you?

Answered: 46 Skipped: 89

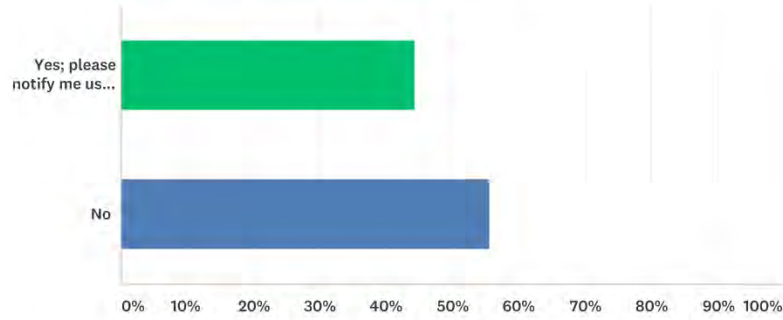


ANSWER CHOICES	RESPONSES	
Yes	76.09%	35
No	23.91%	11
TOTAL		46

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q21 Would you like to be contacted when the Draft 2018 Fullerton Hazard Mitigation Plan is available for review?

Answered: 126 Skipped: 9



ANSWER CHOICES	RESPONSES	
Yes; please notify me using my contact information in the next question.	44.44%	56
No	55.56%	70
TOTAL		126

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q22 If you would like to be notified of future opportunities to participate in hazard mitigation and resiliency planning, please provide your name and e-mail address. If you do not have an e-mail address, please provide your mailing address.

Answered: 53 Skipped: 82

ANSWER CHOICES	RESPONSES	
Full name	98.11%	52
E-mail address	96.23%	51
Street address	88.68%	47
City, State, ZIP	90.57%	48

#	FULL NAME	DATE
1		10/16/2018 12:55 PM
2		10/14/2018 10:24 PM
3		10/14/2018 7:46 PM
4		10/14/2018 1:16 PM
5		10/14/2018 9:20 AM
6		10/14/2018 9:03 AM
7		10/13/2018 6:59 PM
8		10/12/2018 3:27 PM
9		10/12/2018 12:40 PM
10		10/12/2018 11:29 AM
11		10/12/2018 8:53 AM
12		10/12/2018 8:51 AM
13		10/12/2018 8:11 AM
14		10/12/2018 12:16 AM
15		10/11/2018 10:59 PM
16		10/11/2018 10:30 PM
17		10/11/2018 10:22 PM
18		10/11/2018 9:31 PM
19		10/11/2018 9:17 PM
20		10/11/2018 7:09 PM
21		10/11/2018 6:47 PM
22		10/11/2018 6:14 PM
23		10/11/2018 5:50 PM
24		10/11/2018 5:37 PM
25		10/11/2018 5:04 PM
26		10/11/2018 4:51 PM

The names of survey respondents have been redacted to protect their privacy.

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

27		10/11/2018 4:17 PM
28		10/11/2018 4:16 PM
29		10/11/2018 4:04 PM
30		10/11/2018 4:01 PM
31		10/11/2018 3:51 PM
32		10/11/2018 3:44 PM
33		10/11/2018 3:26 PM
34		10/11/2018 3:20 PM
35		10/11/2018 3:08 PM
36		10/11/2018 3:07 PM
37		10/11/2018 3:02 PM
38		10/11/2018 2:50 PM
39		10/11/2018 2:42 PM
40		10/11/2018 2:40 PM
41		10/11/2018 2:39 PM
42		10/11/2018 2:34 PM
43		10/11/2018 2:28 PM
44		10/11/2018 2:27 PM
45		10/11/2018 2:27 PM
46		10/11/2018 2:22 PM
47		10/11/2018 2:16 PM
48		10/11/2018 2:12 PM
49		10/11/2018 10:39 AM
50		10/11/2018 8:35 AM
51		8/30/2018 12:25 AM
52		8/28/2018 8:18 PM

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#	E-MAIL ADDRESS	DATE
1		10/16/2018 12:55 PM
2		10/14/2018 10:24 PM
3		10/14/2018 7:46 PM
4		10/14/2018 1:16 PM
5		10/14/2018 9:20 AM
6		10/14/2018 9:03 AM
7		10/13/2018 6:59 PM
8		10/12/2018 3:27 PM
9		10/12/2018 12:40 PM
10		10/12/2018 11:29 AM
11		10/12/2018 8:53 AM
12		10/12/2018 8:11 AM
13		10/12/2018 4:05 AM
14		10/12/2018 12:16 AM

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Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

15		10/11/2018 10:59 PM
16		10/11/2018 10:30 PM
17		10/11/2018 10:22 PM
18		10/11/2018 9:31 PM
19		10/11/2018 9:17 PM
20		10/11/2018 7:09 PM
21		10/11/2018 6:47 PM
22		10/11/2018 6:14 PM
23		10/11/2018 5:50 PM
24		10/11/2018 5:04 PM
25		10/11/2018 4:51 PM
26		10/11/2018 4:17 PM
27		10/11/2018 4:16 PM
28		10/11/2018 4:04 PM
29		10/11/2018 4:01 PM
30		10/11/2018 3:51 PM
31		10/11/2018 3:44 PM
32		10/11/2018 3:26 PM
33		10/11/2018 3:20 PM
34		10/11/2018 3:08 PM
35		10/11/2018 3:07 PM
36		10/11/2018 3:02 PM
37		10/11/2018 2:50 PM
38		10/11/2018 2:42 PM
39		10/11/2018 2:40 PM
40		10/11/2018 2:39 PM
41		10/11/2018 2:34 PM
42		10/11/2018 2:28 PM
43		10/11/2018 2:27 PM
44		10/11/2018 2:27 PM
45		10/11/2018 2:22 PM
46		10/11/2018 2:16 PM
47		10/11/2018 2:12 PM
48		10/11/2018 10:39 AM
49		10/11/2018 8:35 AM
50		8/30/2018 12:25 AM
51		8/28/2018 8:18 PM
#	STREET ADDRESS	DATE
1		10/16/2018 12:55 PM
2		10/14/2018 10:24 PM
3		10/14/2018 7:46 PM

The emails of survey respondents have been redacted to protect their privacy.

The addresses of survey respondents have been redacted to protect their privacy.

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

4	10/14/2018 1:16 PM
5	10/14/2018 9:20 AM
6	10/14/2018 9:03 AM
7	10/13/2018 6:59 PM
8	10/12/2018 3:27 PM
9	10/12/2018 12:40 PM
10	10/12/2018 11:29 AM
11	10/12/2018 8:51 AM
12	10/12/2018 12:16 AM
13	10/11/2018 10:59 PM
14	10/11/2018 10:30 PM
15	10/11/2018 9:31 PM
16	10/11/2018 9:17 PM
17	10/11/2018 7:09 PM
18	10/11/2018 6:47 PM
19	10/11/2018 5:50 PM
20	10/11/2018 5:37 PM
21	10/11/2018 4:51 PM
22	10/11/2018 4:17 PM
23	10/11/2018 4:16 PM
24	10/11/2018 4:04 PM
25	10/11/2018 4:01 PM
26	10/11/2018 3:51 PM
27	10/11/2018 3:44 PM
28	10/11/2018 3:26 PM
29	10/11/2018 3:20 PM
30	10/11/2018 3:08 PM
31	10/11/2018 3:07 PM
32	10/11/2018 3:02 PM
33	10/11/2018 2:50 PM
34	10/11/2018 2:42 PM
35	10/11/2018 2:40 PM
36	10/11/2018 2:39 PM
37	10/11/2018 2:34 PM
38	10/11/2018 2:28 PM
39	10/11/2018 2:27 PM
40	10/11/2018 2:27 PM
41	10/11/2018 2:22 PM
42	10/11/2018 2:16 PM
43	10/11/2018 2:12 PM
44	10/11/2018 10:39 AM

The addresses of survey respondents have been redacted to protect their privacy.

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

45	The addresses of survey respondents have been redacted to protect their privacy.	10/11/2018 8:35 AM
46		8/30/2018 12:25 AM
47		8/28/2018 8:18 PM
#	CITY, STATE, ZIP	DATE
1	Fullerton, CA, 92832	10/16/2018 12:55 PM
2	Fullerton CA 92833	10/14/2018 10:24 PM
3	Fullerton, CA 92831	10/14/2018 7:46 PM
4	Fullerton, CA 92835	10/14/2018 1:16 PM
5	Fullerton, CA 92833	10/14/2018 9:20 AM
6	92831	10/14/2018 9:03 AM
7	Fullerton, CA 92833	10/13/2018 6:59 PM
8	Fullerton	10/12/2018 3:27 PM
9	Fullerton	10/12/2018 12:40 PM
10	Fullerton, CA 92833	10/12/2018 11:29 AM
11	Fullerton	10/12/2018 8:53 AM
12	Fullerton	10/12/2018 8:51 AM
13	Fullerton	10/12/2018 12:16 AM
14	fullerton, ca 92833	10/11/2018 10:59 PM
15	92835 fullerton ca	10/11/2018 10:30 PM
16	Fullerton, CA 92835	10/11/2018 9:31 PM
17	Fullerton CA 92835	10/11/2018 9:17 PM
18	Fullerton, CA	10/11/2018 7:09 PM
19	Fullerton	10/11/2018 6:47 PM
20	Fullerton, CA, 92833	10/11/2018 5:50 PM
21	Fullerton 92831	10/11/2018 5:37 PM
22	Fullerton, CA 92833	10/11/2018 4:51 PM
23	Fullerton, CA 92833	10/11/2018 4:17 PM
24	Fullerton	10/11/2018 4:16 PM
25	Fullerton, CA 92835	10/11/2018 4:04 PM
26	Fullerton	10/11/2018 4:01 PM
27	FULLERTON	10/11/2018 3:51 PM
28	92833	10/11/2018 3:44 PM
29	Fullerton	10/11/2018 3:26 PM
30	Fullerton, CA 92833	10/11/2018 3:20 PM
31	Fullerton	10/11/2018 3:08 PM
32	Fullerton CA 92835	10/11/2018 3:07 PM
33	Fullerton, CA 92835	10/11/2018 3:02 PM
34	Fullerton	10/11/2018 2:50 PM
35	Fullerton, ca 92831	10/11/2018 2:42 PM
36	Fullerton, CA 92831	10/11/2018 2:40 PM
37	FULLERTON, CA 92833	10/11/2018 2:39 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

38	Fullerton ca 92833	10/11/2018 2:34 PM
39	Brea, CA 92821	10/11/2018 2:28 PM
40	92835	10/11/2018 2:27 PM
41	Fullerton CA 92835	10/11/2018 2:27 PM
42	Fullerton, CA 92831	10/11/2018 2:22 PM
43	Fullerton, CA 92831	10/11/2018 2:16 PM
44	Fullerton Ca 92835	10/11/2018 2:12 PM
45	Fullerton	10/11/2018 10:39 AM
46	Fullerton, CA 92832	10/11/2018 8:35 AM
47	Fullerton	8/30/2018 12:25 AM
48	Fullerton, CA 92833	8/28/2018 8:18 PM

Fullerton Local Hazard Mitigation Plan (LHMP) Community Input Survey

Q23 Please provide us with any additional comments/suggestions/questions that you have regarding your risk of future hazard events.

Answered: 15 Skipped: 120

#	RESPONSES	DATE
1	I am most concerned with fires in the aftermath of a major earthquake.	10/14/2018 7:46 PM
2	Set up a plan to remove all flammable dead trees and weeds from Coyote Hills on a yearly basis before fire season.	10/14/2018 9:20 AM
3	Finding honest, reliable workmen is difficult. A list of people who specialize in earthquake retrofitting, drainage... would be helpful	10/14/2018 7:12 AM
4	My home insurance company is not very forthcoming when I try to clarify my coverage for wildfires. Tips on how to identify if a homeowner is underinsured for disasters (fire and earthquake in particular) would be helpful for any Californian.	10/12/2018 12:09 PM
5	What concerns me is fire, we are a community with a lot of uncleared lots and trees. Fires could start and spread very easily.	10/12/2018 8:53 AM
6	The streets around us are so much busier, more cars than ever, more risk of accidents, speeding. We have a cement block wall but we know cars or trucks can punch through.	10/12/2018 8:51 AM
7	Our main concern is regarding after a big earthquake and the possibility of roving gangs stealing and whatever else they would do. How do we prepare for that?	10/11/2018 9:31 PM
8	How are we going to continue to pay for police and fire service? I see highrise condo/apartments but no increase in fire and police services. Our police and fire people need more paid personnel to alleviate over time and stress. They are the front and back door to our city. What is the long term plan???	10/11/2018 8:00 PM
9	Not enough emergency responders for our city...whether FPD,FFD or CERT members. Folks have to be informed often on city website and any other media available.	10/11/2018 7:09 PM
10	I'm low-income and like to get earthquake insurance but can't afford it with my disability check every month.	10/11/2018 3:08 PM
11	Why ignore the risks of communicable disease? Wouldn't it be better to prepare for it?	10/11/2018 2:47 PM
12	I know orange County vector control is doing all they can regarding the mosquito problem and especially regarding the new invasive species of mosquito. I firmly believe that all a allout effort needs be made to educate the public and all means necessary to eradicate this problem before it becomes a serious public health issue. I truly believe this is the number one threat facing us right now.	10/11/2018 2:39 PM
13	None	10/11/2018 2:34 PM
14	We might want to consider Amateur Radio Operators as a communication resource in the event of a disaster or emergency.	10/11/2018 2:27 PM
15	Ask maintenance workers across the city for input.	9/16/2018 10:07 AM

APPENDIX C

ADOPTION RESOLUTION

- City council resolution of adoption

RESOLUTION NO. 2020-42

A RESOLUTION OF THE CITY OF FULLERTON, CALIFORNIA, ADOPTING THE CITY OF FULLERTON LOCAL HAZARD MITIGATION PLAN AS APPROVED BY FEMA ON JUNE 10, 2019 AND CORRESPONDING REVISIONS TO THE FULLERTON PLAN, INCLUDING A COMPREHENSIVE UPDATE TO APPENDIX I, THEREBY ADOPTING THE LOCAL HAZARD MITIGATION PLAN INTO THE SAFETY ELEMENT OF THE CITY'S GENERAL PLAN PURSUANT TO GOVERNMENT CODE SECTION 65302.6

LOCAL HAZARD MITIGATION PLAN
APPLICANT: CITY OF FULLERTON

RECITALS:

WHEREAS Fullerton Municipal Code (FMC) Section 2.18.080 establishes the Powers and Duties of the Planning Commission including "to recommend and implement a master or general plan or amendments thereto..." Government Code Section 65353(a) provides that when the Planning Commission has such authorization, the Commission shall hold at least one public hearing before making a recommendation on the adoption of or amendment of a general plan to the City Council; and

WHEREAS the Planning Commission of the City of Fullerton has held a duly noticed public hearing on April 15, 2020, as required by law, to consider adoption of the Local Hazard Mitigation Plan as approved by FEMA on June 10, 2019 and corresponding revisions to The Fullerton Plan and recommended approval to the City Council;

WHEREAS the City Council of the City of Fullerton has held a duly noticed public hearing, as required by law, to consider adoption of the Local Hazard Mitigation Plan as approved by FEMA on June 10, 2019 and corresponding revisions to The Fullerton Plan;

WHEREAS the City Council does, pursuant to the California Environmental Quality Act (CEQA) Guidelines, finds that the proposed project is statutorily exempt from CEQA review per Section 15061(b)(3);

WHEREAS Government Code Section 65302.6 establishes that a city may adopt a LHMP as part of the safety element of the general plan and in so doing, pursuant to Government Code Section 8685.9, this makes the City eligible to recover additional disaster reimbursement from the State pursuant to AB2140 (2006).

RESOLUTION

The City Council finds as follows:

1. In all respects as set forth in the Recitals of this Resolution.

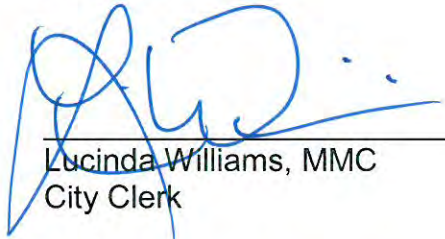
THEREFORE, the Fullerton City Council finds the project statutorily exempt pursuant to CEQA Guidelines 15061(b)(3) and adopts the City of Fullerton Local Hazard Mitigation Plan as approved by FEMA on June 10, 2019 and corresponding revisions to The Fullerton Plan, including a comprehensive update to Appendix I, thereby adopting the Local Hazard Mitigation Plan into the Safety Element of the City's General Plan pursuant to Government Code Section 65302.6.

ADOPTED BY THE FULLERTON CITY COUNCIL ON MAY 19, 2020.



Jennifer Fitzgerald
Mayor

ATTEST:



Lucinda Williams, MMC
City Clerk

May 20, 2020
Date

Attachments:

Attachment 1 – Amendments to The Fullerton Plan

Chapter

10

Public Safety

Fullerton will be a city which values and provides quality public safety services including emergency services, crime prevention and hazard mitigation.
-The Fullerton Vision

Introduction

Safe and vital neighborhoods, business districts and recreational areas, including the buildings and infrastructure therein, are among Fullerton's most valued qualities and highest priorities. The City's police and fire systems and professionals, as well as its building and code enforcement professionals, provide residents, business owners, property owners, and visitors with a reliable, community-oriented presence that results in effective, preventative and responsive public safety services.

The Public Safety Chapter seeks to sustain and improve the City's commitment to safety through proactive and comprehensive police, fire, building, and code enforcement services that advance community outreach, education, and awareness, reinforce partnerships, promote prevention, and enhance the technical, logistical and technological systems and tools to prepare for and respond to public safety needs.

The following goals and policies are provided to achieve the Fullerton Vision as it pertains to Public Safety.

Associated Tables and Exhibits

- Exhibit 15: Police and Fire Protection Facilities (page 175)
- Exhibit 16: Parcels Located within Fullerton Municipal Airport Runway Protection Zone - Land Use (page 177)
- Exhibit 17: Parcels Located within Fullerton Municipal Airport Accident Potential Zone (APZ II) (page 179)
- Exhibit 18: Part 77 Airspace Plan (page 181)

Overarching Policies

- OAP1.** Comply with State and Federal laws and regulations while maintaining local control in decision-making.
- OAP2.** Pursue Federal, State and local funding options to support implementation of The Fullerton Plan.
- OAP3.** Leverage the advantages and advances of technology.
- OAP4.** Seek opportunities for increased efficiency and effectiveness.

Purpose

The purpose of the Public Safety Element is to provide quality public safety services needed to serve the existing and expected future population in Fullerton.

This Element is required per California Government Code Section 65302.

The City of Fullerton Local Hazard Mitigation Plan (LHMP) has been adopted as part of The Fullerton Plan Safety Element. The Safety Element is divided into two chapters of The Fullerton Plan: Natural Hazards (Chapter 21) and Public Safety (Chapter 10) with additional policies in Public Health (Chapter 11), Water (Chapter 16), Air Quality and Climate Change (Chapter 17), Integrated Waste Management (Chapter 18), and Natural Hazards (Chapter 20). The LHMP evaluates risk to the community from seismic hazards, fire, drought, severe weather, dam failure, human-caused hazards, geologic hazards, flooding, hazardous materials release, and disease/pests. It identifies critical facilities and vulnerable populations within areas of elevated hazard risk. The LHMP includes a hazard mitigation strategy including a prioritized list of mitigation actions to improve Fullerton's resiliency to hazard events.

GOAL 12: Proactively addressing public safety concerns.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P12.1 Healthy Family Development

Support programs that strengthen regional partnerships between public safety and human services agencies to encourage strong family relationships, reinforce healthy child development and encourage lawful behavior.

P12.2 Collaboration with Outside Agencies

Support regional and subregional efforts to prevent violence, child abuse, sexual assault, domestic violence, illegal use of firearms, violence associated with substance abuse, crimes against property and other similar issues.

City Level

P12.3 Community Confidence Building

Support policies and programs that bolster productive communication and problem-solving between public safety personnel and the Fullerton community.

P12.4 Balance Safety Needs

Support policies, projects, programs, and regulations that balance the need to reduce vehicle accidents, injuries, and deaths through traffic calming and street design with the need to facilitate emergency response times.

P12.5 Community Preservation

Support policies, programs and regulations pertaining to proactive code enforcement methods which reinforce the proper maintenance of properties, buildings and landscapes, and adherence to applicable regulations, while discouraging conditions that foster vandalism and more serious crime.

P12.6 Youth Community Safety Partnership

Support programs that involve young people in discussions about crime and prevention, increase youths' attachment to the community, engage youth in productive activities, and reinforce success in education.

P12.7 Fire Code Amendments

Support policies, programs and regulations that give the Fire Marshall flexibility to approve streets and fire lanes with reduced clearance requirements when other fire safety factors are incorporated into the project (such as street connectivity, traffic safety and the presence of sprinkler systems).

P12.7.1 THIRA*

Support projects, programs, policies and regulations that facilitate the preparation of a THIRA (Threat and Hazard Identification Risk Assessment) plan in accordance with FEMA guidelines that allows Fullerton to plan for and address the risks of human-caused hazards.

GOAL 14: An environment with opportunities for community health and wellbeing.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

- P14.1 Coordination**
Support programs to coordinate with state, county and regional agencies to improve public health and well-being through a range of efforts with regional, subregional and local agencies including schools, local medical facilities, senior centers and adjacent jurisdictions.

City Level

- P14.2 Healthy Living**
Support policies, projects, programs and regulations that result in changes to the physical environment to improve health, well-being and physical activity.
- P14.3 Farmers' Markets**
Support policies, projects, programs and regulations that facilitate successful farmers' markets at appropriate and convenient locations throughout the City.
- P14.4 Community Gardens**
Support policies, projects, programs and regulations that encourage community gardens that are operated and managed by local volunteers and that provide for small-scale local food production in areas convenient to residents.

P14.4.1 Public Health Education*

Support policies, projects, programs, and regulations that disseminate information on low-cost or free healthcare resources both within Fullerton and the surrounding region and that keep residents informed of trending public health hazards and diseases.

P14.4.2 Contagion and Pest Abatement*

Support policies, projects, programs and regulations that allow the City to address any epidemics or vector-borne diseases that arise in the future through emergency closures of public areas, vegetation removal, storm drain clearance, and other such actions.

Neighborhood/District Level

- P14.5 Opportunities for Physical Activity**
Support policies, projects, programs and regulations that provide for convenient and safe areas that facilitate opportunities for physical activity such as parks, trails, open space, safe streets for bicycling, safe sidewalks for walking, and recreational facilities for residents of all ages and abilities. (See Chapter 12: Parks and Recreation for related policies.)

Chapter 16

Water

Fullerton will be a city which is committed to environmental sustainability in planning design, policy and practice.
-The Fullerton Vision

Introduction

The City's quality of life is dependent upon water and natural watershed resources. In addition to fundamental health and sanitation, an adequate supply of potable water provides significant public and private benefits such as irrigation, ecological habitat, recreation opportunities and aesthetics.

A threat to water resources is drought. Droughts are periods of time when water is scarce due to reduced rainfall. In urbanized areas like Fullerton, this can take the form of deteriorating landscapes in private homes and businesses as well as in public facilities, such as parks. As a segment of Fullerton's water supply is imported from other locations across the state, a drought in these areas may affect the City. Given how frequent droughts are in California, it is highly likely that Fullerton will be impacted at some point in the future by the effects of drought. Within Fullerton, as well as the region, water management is shifting increasingly toward water conservation and efficiency technologies used in planning, design, and construction of sites, buildings, and land uses. Additionally, urban runoff and storm water management is of growing concern at the local, regional, State and Federal levels, and regulations and practices pertaining to storm water are influencing the interrelationships between the built and natural environments.

The Water Element seeks to effectively manage water and natural watershed resources, including water supply, demand, quality, and storm water.

The following goals and policies are provided to achieve the Fullerton Vision as it pertains to Water.

Associated Tables and Exhibits

Exhibit 25.1: Statewide Drought Conditions (page 205.2)*

Overarching Policies

OAP1. Comply with State and Federal laws and regulations while maintaining local control in decision-making.

OAP2. Pursue Federal, State and local funding options to support implementation of The Fullerton Plan.

OAP3. Leverage the advantages and advances of technology.

OAP4. Seek opportunities for increased efficiency and effectiveness.

Purpose

The purpose of the Water Element is to ensure that the City has adequate water resource capacities and water quality to meet future growth needs.

This Element is not required per California Government Code Section 65302; however, as water is of importance to the community of Fullerton, it is prepared as an optional element per California Government Code Section 65303.

GOAL 19: **An adequate, safe, and reliable water supply.**

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P19.1 Agency Coordination for Water Supplies
Support regional and subregional efforts to ensure that an adequate water supply, including groundwater, remains available.

P19.2 Conservation Efforts
Support regional and subregional efforts to promote water efficiency and conservation.

P19.3 New Technologies
Support projects, programs, policies and regulations to encourage the use of new technologies which reduce water use.

P19.3.1 Regional Water Protection*
Support regional and subregional efforts to safeguard water infrastructure and supply against the treats of contamination or disruption from disaster events of a regional or national scale, such as terrorism, earthquakes, floods, geologic activity, or other events as they arise.

P19.3.2 Climate Resilience in Water Supply*
Support regional and subregional efforts to adapt current water supply practices in anticipation of reduced water availability due to the effects of climate change.

City Level

P19.4 Adequate Supply
Support projects, programs, policies and regulations to maintain adequate quantities of water, including groundwater, available to the City now and in the future.

P19.5 Water Quality
Support projects, programs, policies and regulations to ensure the quality of the water supply.

P19.5.1 Water-saving Infrastructure*
Support projects, programs, policies, and regulations that will lead to the capture, storage, and re-use of rainwater in the city so as to reduce Fullerton's dependence on external sources of water.

Neighborhood/District Level

P19.6 Focus Area Planning
Support projects, programs, policies and regulations to evaluate ways to conserve and reduce water use as part of community-based planning of Focus Areas.

Project Level

P19.7 Sustainable Water Practices in New Development
Support projects, programs, policies and regulations to encourage water efficient practices in site and building design for private and public projects.

GOAL 20: A healthy watershed and clean urban runoff.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

- P20.1 Regional Watersheds**
Support regional and subregional efforts to support functional and healthy watersheds.
- P20.2 Urban Runoff Management**
Support regional and subregional efforts to support cleaner and reduced urban runoff.

City Level

- P20.3 Product Handling and Disposal Impacts**
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff from the improper handling and disposal of commercial products.

- P20.3.1 Natural Water System Integrity***
Support projects, programs, policies and regulations that encourage the re-emergence of natural watersheds throughout the city's extent.

Neighborhood/District Level

- P20.4 Local Watersheds**
Support projects, programs, policies and regulations that support a functional and healthy watershed within neighborhoods and districts.

- P20.5 Water Quality of Focus Areas**
Support projects, programs, policies and regulations to encourage site and infrastructure improvements within the City's Focus Areas to support cleaner and reduced urban runoff.

Project Level

- P20.6 Construction Impacts**
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by private and public construction projects.
- P20.7 Development Impacts**
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by the design or operation of a site or use.
- P20.7.1 Incorporate Natural Water Systems in Design Standards***
Support projects, programs, policies and regulations that encourage the preservation of natural creeks and waterways into new projects and developments in Fullerton.

Chapter 17

Air Quality and Climate Change

Fullerton will be a city which is committed to environmental sustainability in planning design, policy and practice.
-The Fullerton Vision

Introduction

As a city located within the Southern California region, Fullerton is aware of and concerned about its air quality. The region is challenged by poor air quality caused by a number of contributing factors, and the City of Fullerton is dedicated to its role in achieving the objectives of regional air quality programs. In addition to general air quality issues, a consensus exists within the scientific and, in general, other sectors, that climate change is occurring. Assembly Bill 32, the Global Warming Solutions Act, requires California to reduce greenhouse gas emissions to 1990 levels by 2020. Although actions taken on a local level cannot resolve this global issue, the City of Fullerton is committed to implementing policies that address energy and resource conservation.

Climate change is expected to either compound the effects or increase the severity of certain hazards in and around Fullerton. For instance, fire hazards may likely become more frequent and destructive due to hotter temperatures and reduced water availability. Flooding may become more widespread since drier ground is less able to absorb urban runoff. Certain diseases and pests may become more prevalent due to longer mating seasons. For many of these hazards, the City's Local Hazard Mitigation Plan (Appendix I) identifies strategies to address some of these potential impacts, increasing overall community resilience.

The Air Quality and Climate Change Element seeks to protect the well-being of Fullerton's citizens through improvement of air quality, and addressing climate change through the integration of a climate action plan.

The following goals and policies are provided to achieve the Fullerton Vision as it pertains to Air Quality and Climate Change.

Overarching Policies

OAP1. Comply with State and Federal laws and regulations while maintaining local control in decision-making.

OAP2. Pursue Federal, State and local funding options to support implementation of The Fullerton Plan.

OAP3. Leverage the advantages and advances of technology.

OAP4. Seek opportunities for increased efficiency and effectiveness.

Purpose

The purpose of the Air Quality and Climate Change Element is to protect the health and welfare of the community through policies aimed at improving air quality, reducing greenhouse gas emissions and working toward reducing the potential adverse effects of climate change.

This Element is not required per California Government Code Section 65302; however, as air quality and climate change are of importance to the community of Fullerton, it is prepared as an optional element per California Government Code Section 65303.

The Climate Action Plan (CAP) will be adopted in conjunction with The Fullerton Plan and EIR. This Chapter contains a summary of the CAP strategies. Refer to the full CAP, provided in as an appendix to the EIR, for additional information.

GOAL 22: Participation in regional efforts to address climate change and its local impacts.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

- P22.1 Motor Vehicle-related GHG Emissions**
Support regional and subregional efforts to reduce greenhouse gas emissions associated with transportation through land use strategies and policies, transportation system improvements, and transportation demand management programs.
- P22.2 GHG Emissions from Electrical Generation**
Support regional and subregional efforts to reduce greenhouse gas emissions associated with electrical generation through energy conservation strategies and alternative/renewable energy programs.
- P22.3 GHG Emissions from Water Conveyance**
Support regional and subregional efforts to reduce greenhouse gas emissions associated with water conveyance through water conservation strategies and alternative supply programs.
- P22.4 Solid Waste-Related GHG Emissions**
Support regional and subregional efforts to reduce emissions associated with solid waste through increased recycling programs and reduced waste strategies. (See Chapter 18: Integrated Waste Management for related policies.)

City Level

- P22.5 Technology to Reduce Emissions**
Support projects, programs, policies and regulations to use technology whenever feasible to minimize travel for City meetings and trainings.
- P22.6 GHG Emissions from Waste**
Support projects, programs, policies and regulations to reduce greenhouse gas emissions from waste through improved management of waste handling and reductions in waste generation. (See Chapter 18: Integrated Waste Management for related policies.)

P22.7 Climate Adaptation

Support projects, programs, policies and regulations to address climate change impacts relevant to the City as an inland community, including rises in average and extreme temperature, less annual precipitation, more flooding during El Niño seasons, increased power outages and higher levels of smog.

Neighborhood/District Level

P22.8 Sustainable Communities Strategies

Support projects, programs, policies and regulations to coordinate future community-based planning efforts of the Focus Areas for consistency with the SCAG Sustainable Communities Strategy and Orange County Sustainable Communities Strategy.

P22.8.1 Adopt Neighborhood Plans*

Support projects, programs, policies and regulations to prepare local communities in Fullerton to prepare for the increased risks associated with climate change, such as Community Wildfire Preparedness Plans and evacuation plans in case of flood inundation or dam failure.

Project Level

P22.9 Development

Support projects which voluntarily desire to implement site and/or building design features exceeding minimum requirements to reduce project greenhouse gas emissions.

P22.9.1 Anticipatory Climate Resilient Design*

Support projects that incorporate design elements and standards that anticipate the effects of a warming climate with features that protect against intensified and increased disaster risk.

Chapter 18

Integrated Waste Management

Fullerton will be a city which is committed to environmental sustainability in planning design, policy and practice.
-The Fullerton Vision

Introduction

Integrated waste management is described as a system for reducing, collecting, recycling and disposing of waste products generated by residential, institutional, commercial, and industrial land uses. The City of Fullerton, recognizing the importance of reduce, reuse and recycle wherever possible, continues to pursue the integrated waste management practices that were borne in 1989 when the State Legislature passed AB 939, requiring that cities reduce the amount of waste going to landfill sites.

Hazardous materials in and around the Fullerton community have the potential to be released and endanger public health and safety. Ongoing oil and gas operations in Fullerton may lead to air pollution, oil spills, and groundwater contamination. Other sites use or store chemicals that are dangerous when exposed to humans. Sewer lines or gas pipelines running through Fullerton may also breach during a hazard event and can release their contents underground or on the surface, potentially compromising water supplies or endangering personal health.

The Integrated Waste Management Element seeks to encourage solid waste reduction and provide for the efficient recycling and disposal of refuse and solid waste material without deteriorating the environment.

The following goal and policies are provided to achieve the Fullerton Vision as it pertains to Integrated Waste Management.

Overarching Policies

- OAP1.** Comply with State and Federal laws and regulations while maintaining local control in decision-making.
- OAP2.** Pursue Federal, State and local funding options to support implementation of The Fullerton Plan.
- OAP3.** Leverage the advantages and advances of technology.
- OAP4.** Seek opportunities for increased efficiency and effectiveness.

Purpose

The purpose of the Integrated Waste Management Element is encourage an environmentally sound waste management system which uses resource recovery, recycling, and source reduction.

This Element is not required per California Government Code Section 65302; however, as integrated waste management is of importance to the community of Fullerton, it is prepared as an optional element per California Government Code Section 65303.

GOAL 23: Safe and efficient management of waste.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P23.1 Regional Waste Management
Support regional and subregional efforts to increase recycling, waste reduction, and product reuse.

P23.1.1 Regional Hazardous Waste Control*
Support regional and subregional efforts to control and limit the amount of hazardous waste that is released into regional air basins and watersheds as well as limiting the transport of hazardous materials along certain corridors only.

City Level

P23.2 Hazardous Waste
Support projects, programs, policies and regulations to promote safe handling and disposal by households, businesses and City operations of solid waste which has specific disposal requirements.

P23.3 Waste Reduction and Diversion
Support projects, programs, policies and regulations to promote practices to reduce the

amount of waste disposed in landfills.

P23.4 Waste Stream Separation and Recycling
Support projects, programs, policies and regulations to expand source separation and recycling opportunities to all households, businesses and City operations

Neighborhood/District Level

P23.5 Recycling Centers
Support projects, programs, policies and regulations to develop neighborhood-serving, State-certified recycling facilities in neighborhoods and districts.

P23.6 Focus Area Waste Management
Support projects, programs, policies and regulations to evaluate ways to increase recycling and product reuse and reduce waste as part of community-based planning of Focus Areas.

Project Level

P23.7 Waste Management
Support projects, programs, policies and regulations to consider project level solid waste management needs at the site and building design stages.

Also see Chapter 17: Air Quality and Climate Change, P21.5 Product Handling and Disposal Impacts, P22.4 Solid Waste GHG Emissions and P22.6 GHG Emissions for Solid Waste.

GOAL 24: Responsible management of open spaces balanced with the healthy functioning of environmental systems.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

P24.8 Environmentally Sensitive Areas
Support projects, programs, policies and regulations to preserve the environmentally sensitive areas of public open spaces.

P24.9 Passive Open Space
Support projects, programs, policies and regulations to encourage diverse, environmentally-sensitive, passive open spaces.

Neighborhood/District Level

P24.10 Trail Linkages to Open Space
Support projects, programs, policies and regulations to promote recreational trails and the bikeway system to link open spaces to public areas and neighborhoods.

P24.11 Open Space in Focus Areas
Support projects, programs, policies and regulations to evaluate increasing urban and natural open spaces as part of community-based planning of Focus Areas.

P24.11.1 Manage Wildfire Areas*

Support projects, programs, policies and regulations to manage and reduce the risk of wildfire in Very High, High, and Moderate Fire Hazard Severity Zones throughout the City through fire hazard abatement practices.

Project Level

P24.12 Environmental Impact of Support Facilities
Support projects, programs, policies and regulations to limit the construction of facilities in open space areas and to design necessary improvements, such as fire roads, access roads, and parking facilities, to minimize environmental impacts and maintain the visual qualities of the open space.

P24.13 Maintenance of Sensitive Areas
Support programs, policies and regulations to require maintenance of environmentally-sensitive areas by qualified/trained personnel and/or contractors.

P24.13.1 Resilient Management*

Support projects, programs, policies and regulations which increase the resilience of open space and natural areas to increased risk of fire, flood, and geologic hazards.

Chapter 20

Natural Hazards

Fullerton will be a city which values and provides quality public safety services including emergency services, crime prevention and hazard mitigation.
-The Fullerton Vision

Introduction

Consistent with State law, the City of Fullerton is committed to protecting the community from any unreasonable risks associated with the effects of seismically induced events, slope instability leading to mudslides and landslides, subsidence and other known geologic hazards, flooding, and wild land and urban fires.

Severe weather events such as high winds, extreme heat, heavy rains, or tornadoes can cause property damage, lead to disruptions in services and infrastructure, or cause injury or death. Any winds over 47 miles per hour are considered destructive as they can blow over utility poles and launch debris at people caught outside. Extreme heat caused by higher than normal temperatures or high humidity can cause harm to human health. In Fullerton, an extreme heat day is when temperatures reach or exceed 98.4°F. Heavy rains in Fullerton generally occur during the winter season when El Niño weather conditions or atmospheric rivers bring rain from other parts of the world to Southern California. Severe or prolonged heavy rain can lead to flooding in the City, particularly in areas with high amounts of pavement and other impervious surfaces. Floods are measured by their likelihood of occurrence. A 100-year flood has a 1 in 100 chance of occurring during any given year while a 500-year flood has a 1 in 500 chance of occurring during any given year. Fullerton has both 100- and 500-year floodplains as designated by FEMA. Tornadoes are cycling columns that rotate at extremely high speeds ranging from 65 to 200 miles per hour or faster. While tornadoes are rare in California, a few have occurred in or near Fullerton throughout recorded history. All of these events are likely to continue occurring in Fullerton.

The Natural Hazards Element seeks to reduce the potential risk of death, injuries, property damage and economic and social dislocation resulting from natural hazards within or affecting the Fullerton community.

The following goal and policies are provided to achieve the Fullerton Vision as it pertains to Natural Hazards.

Overarching Policies

OAP1. Comply with State and Federal laws and regulations while maintaining local control in decision-making.

OAP2. Pursue Federal, State and local funding options to support implementation of The Fullerton Plan.

OAP3. Leverage the advantages and advances of technology.

OAP4. Seek opportunities for increased efficiency and effectiveness.

Purpose

The purpose of the Natural Hazards Element is to protect life, prevent human injury and reduce the potential for property damage throughout Fullerton.

This Element is required per California Government Code Section 65302.

Associated Tables and Exhibits

Exhibit 26: Local and Regional Fault Lines* (page 207)

Exhibit 27: Liquefaction Zones* (page 209)

Exhibit 27.1: Landslide Potential* (page 209.2)

Exhibit 28: Fire Hazard Zones* (page 211)

Exhibit 29: Dam Failure Inundation Zone* (page 213)

Exhibit 30: FEMA Flood Zones* (page 215)

The City of Fullerton Local Hazard Mitigation Plan (LHMP) has been adopted as part of The Fullerton Plan Safety Element. The Safety Element is divided into two chapters of The Fullerton Plan: Natural Hazards (Chapter 21) and Public Safety (Chapter 10) with additional policies in Chapters 11, 16, 17, 18, and 20. The LHMP evaluates risk to the community from natural and human-caused hazards and includes prioritized mitigation actions.

GOAL 26: Protection of people, natural and built environments and economy from natural hazards.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P26.1 Regional Coordination
Support projects, programs, policies and regulations to coordinate planning for and response to natural disasters with other agencies within the region.

City Level

P26.2 Adequate Emergency Response Infrastructure
Support projects, programs, policies and regulations to prepare to respond to natural disasters to the best of the City's ability.

P26.2.1 Continual Efforts*
Support projects, programs, policies and regulations to continually update and refine the City's Safety Element, Local Hazard Mitigation Plan, Emergency Operations Plan, and other plans as staff may deem relevant with the latest available information on hazards and disaster risk in Fullerton.

Neighborhood/District Level

P26.3 Focus Area Planning
Support projects, programs, policies and regulations to consider natural hazard risks and mitigation as part of community-based planning of Focus Areas.

P26.3.1 Community Hazard Mapping*

Support projects, programs, policies and regulations that help communities and residents of neighborhood blocks understand what kinds of hazards could occur in their area and which areas are the most susceptible to fire, geologic, seismic, and flooding hazards.

Project Level

P26.4 Minimization of Development in High Risk Areas

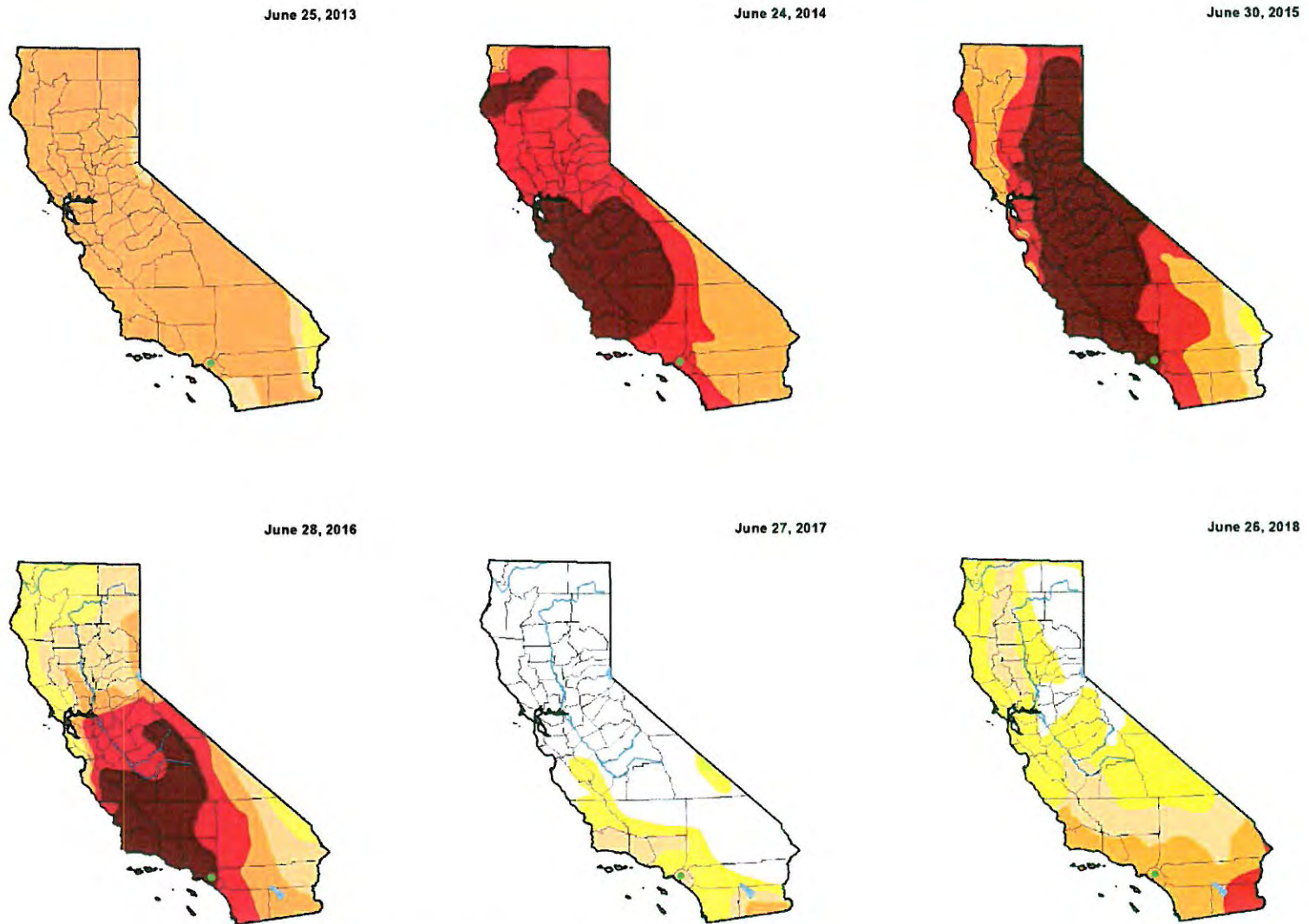
Support projects, programs, policies and regulations to discourage or limit development within areas that are vulnerable to natural disasters, particularly in areas with recurring damage and/or the presence of multiple natural hazards.

P26.5 Hazard Specific Development Regulations

Support projects, programs, policies and regulations to utilize hazard specific development regulations to mitigate risks associated with identified potential natural hazards, including flooding, wildland fires, liquefaction, and landslides when development does occur.

Also see Chapter 10: Public Safety for related policies.

Exhibit 25.1 - Statewide Drought Conditions from 2013 to 2018



● Approximate Location of the City of Fullerton

Exhibit 26 - Local and Regional Fault Lines Map

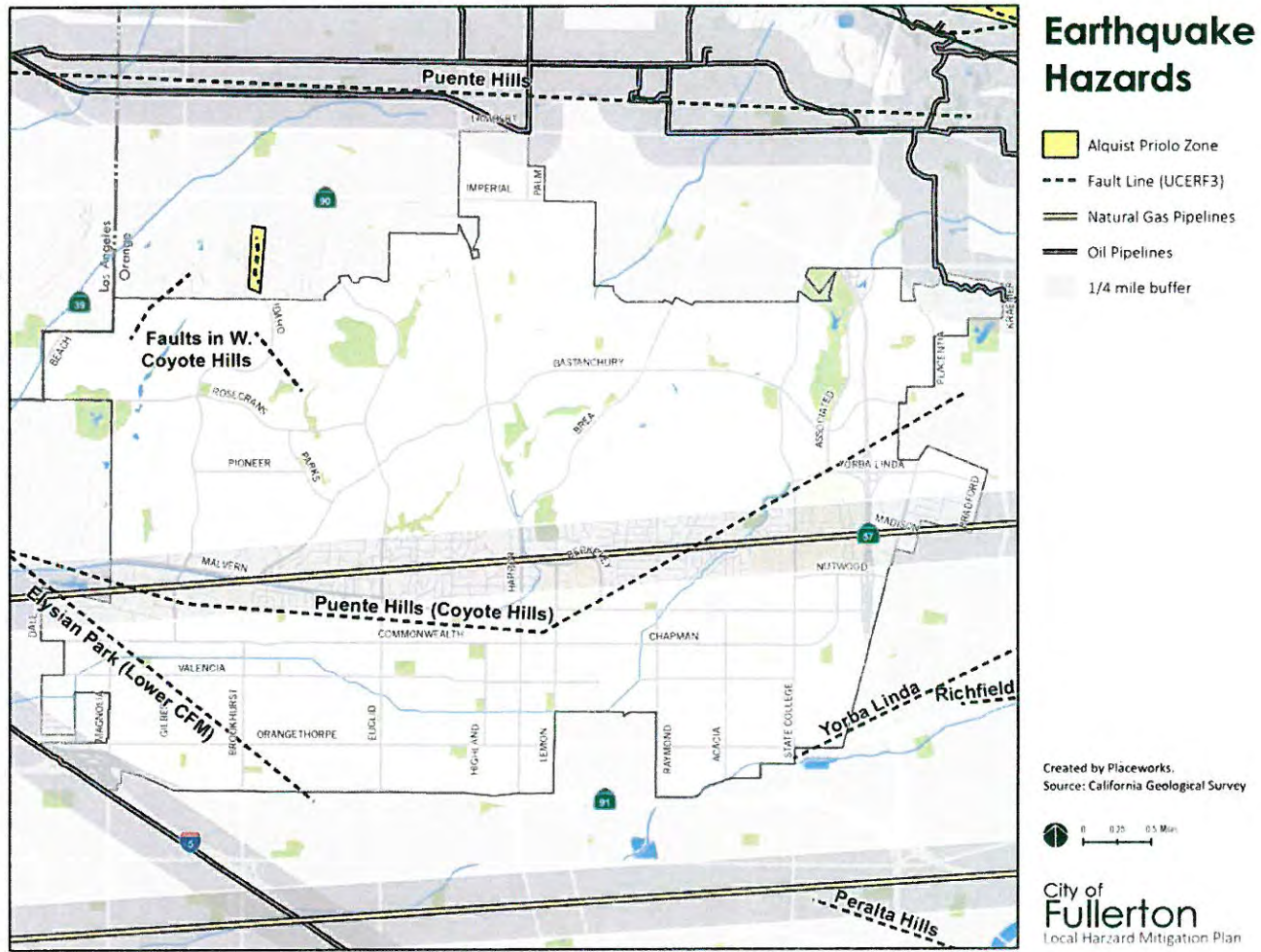


Exhibit 27 - Liquefaction Zones

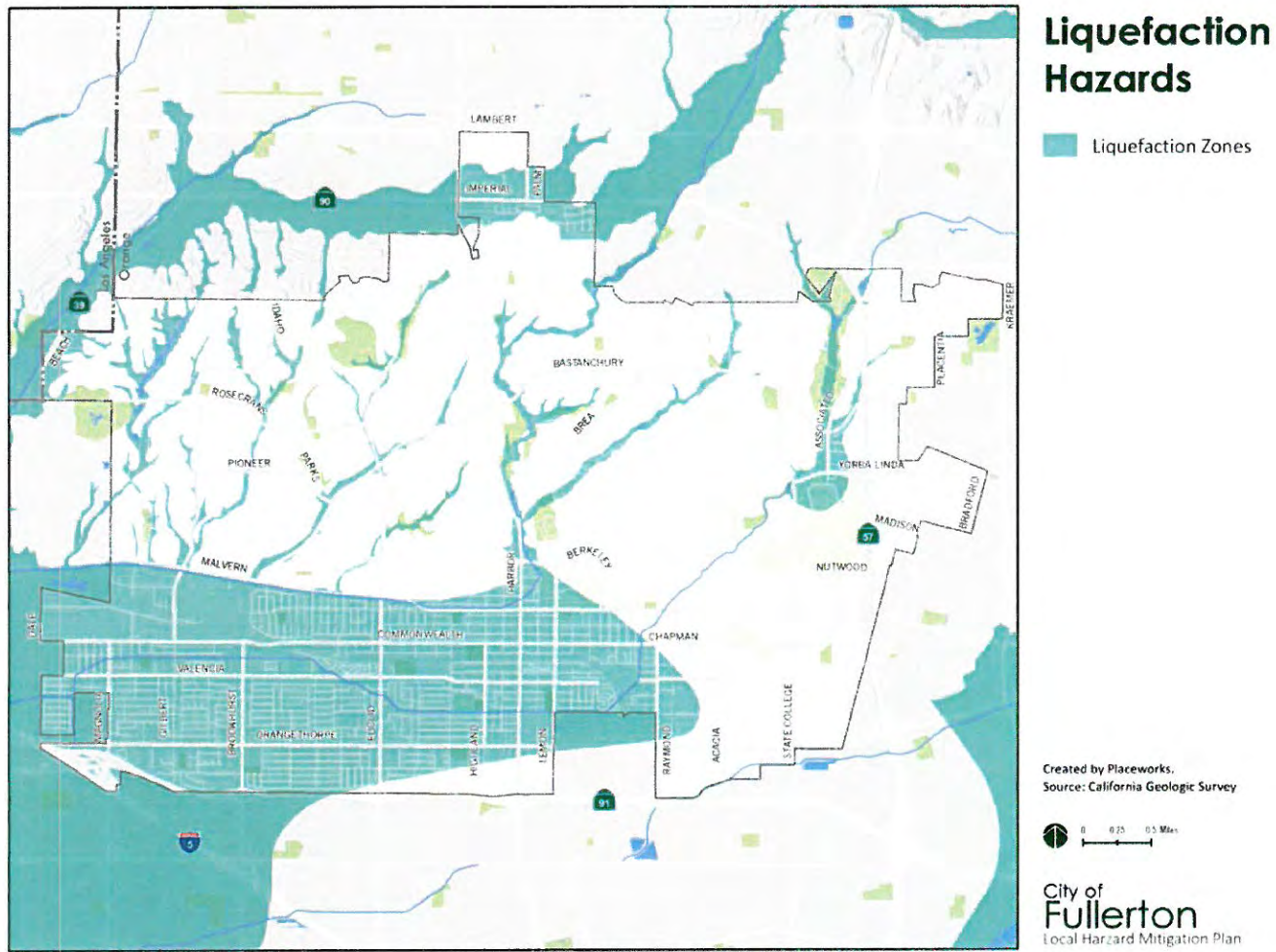


Exhibit 27.1 - Landslide Potential

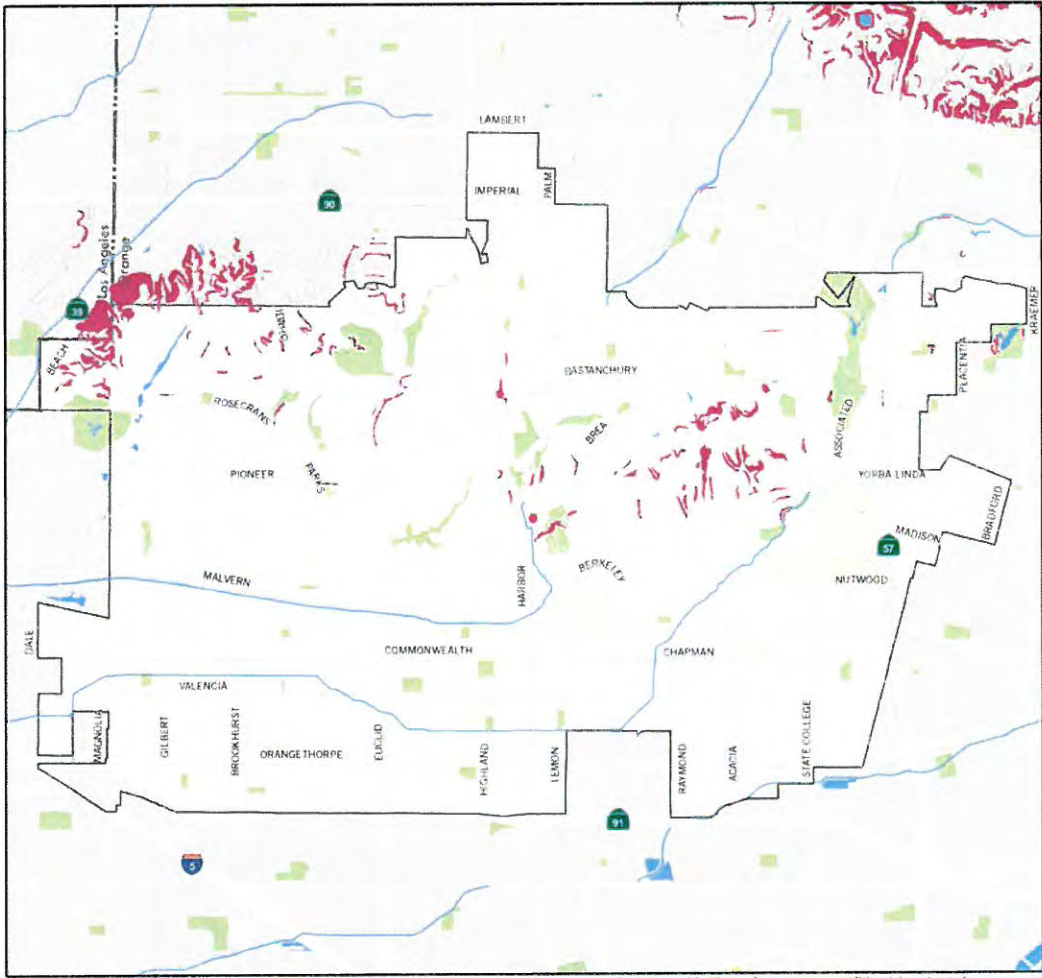


Exhibit 28 - Fire Hazard Zones

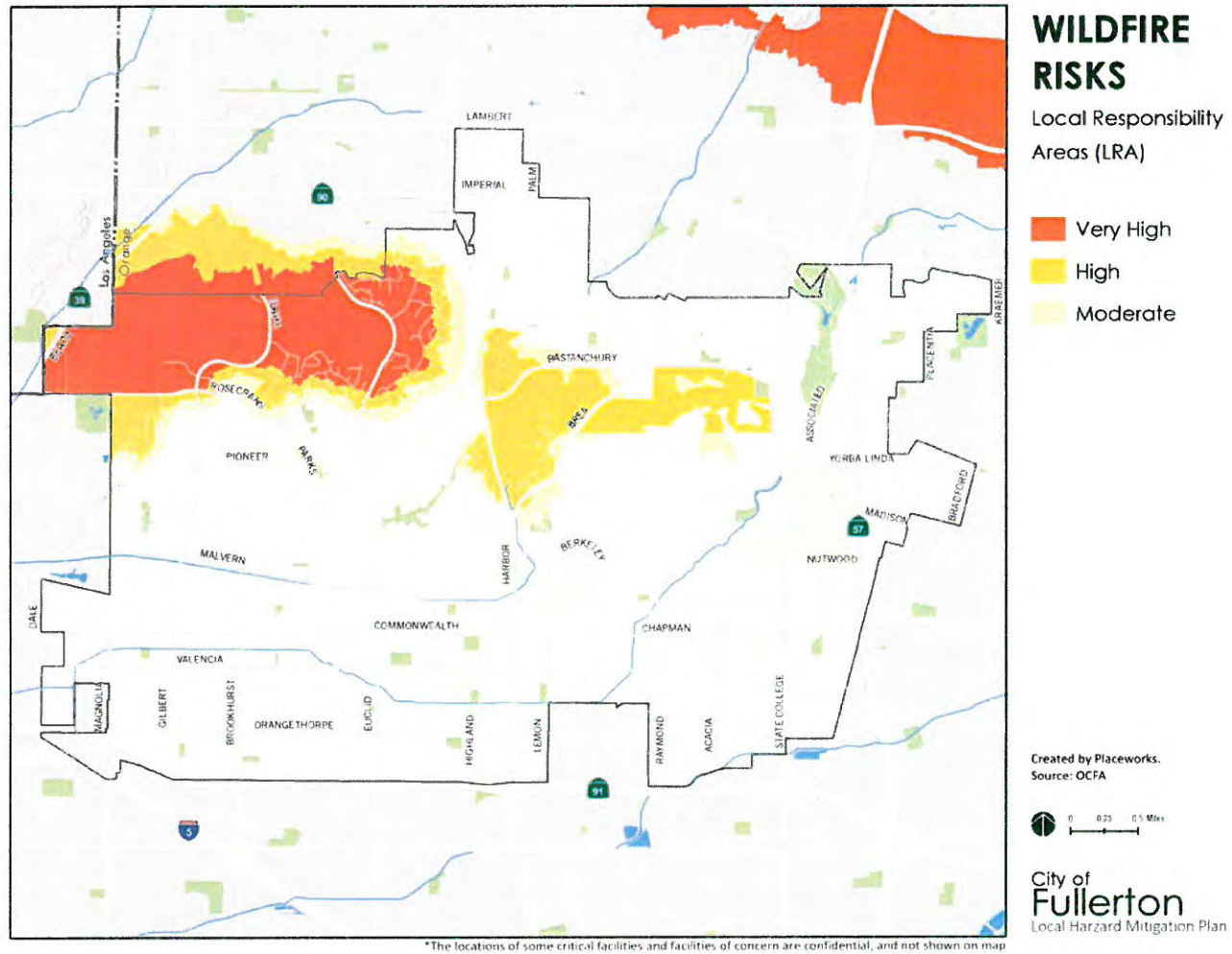


Exhibit 29 - Dam Failure Inundation Zones

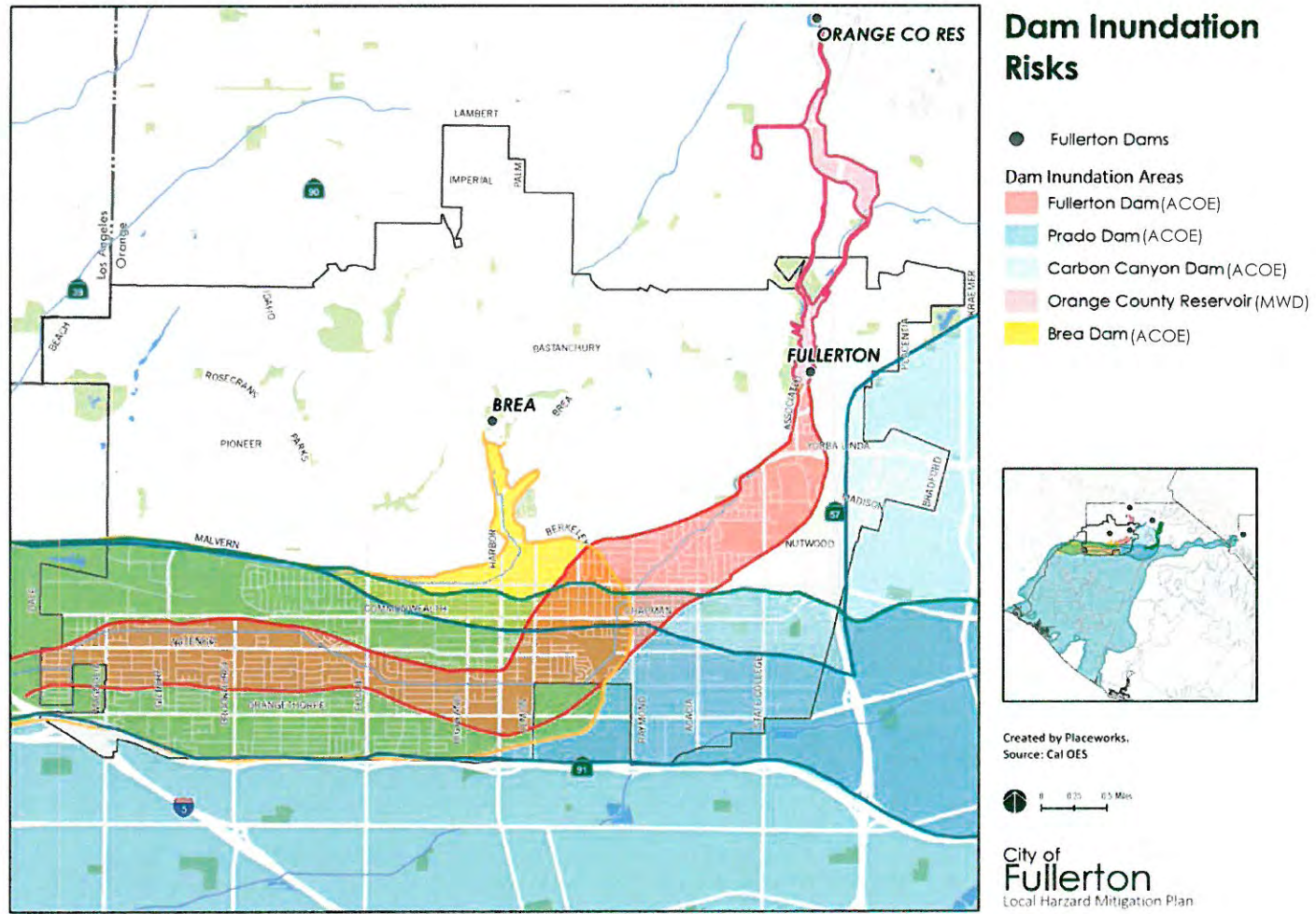
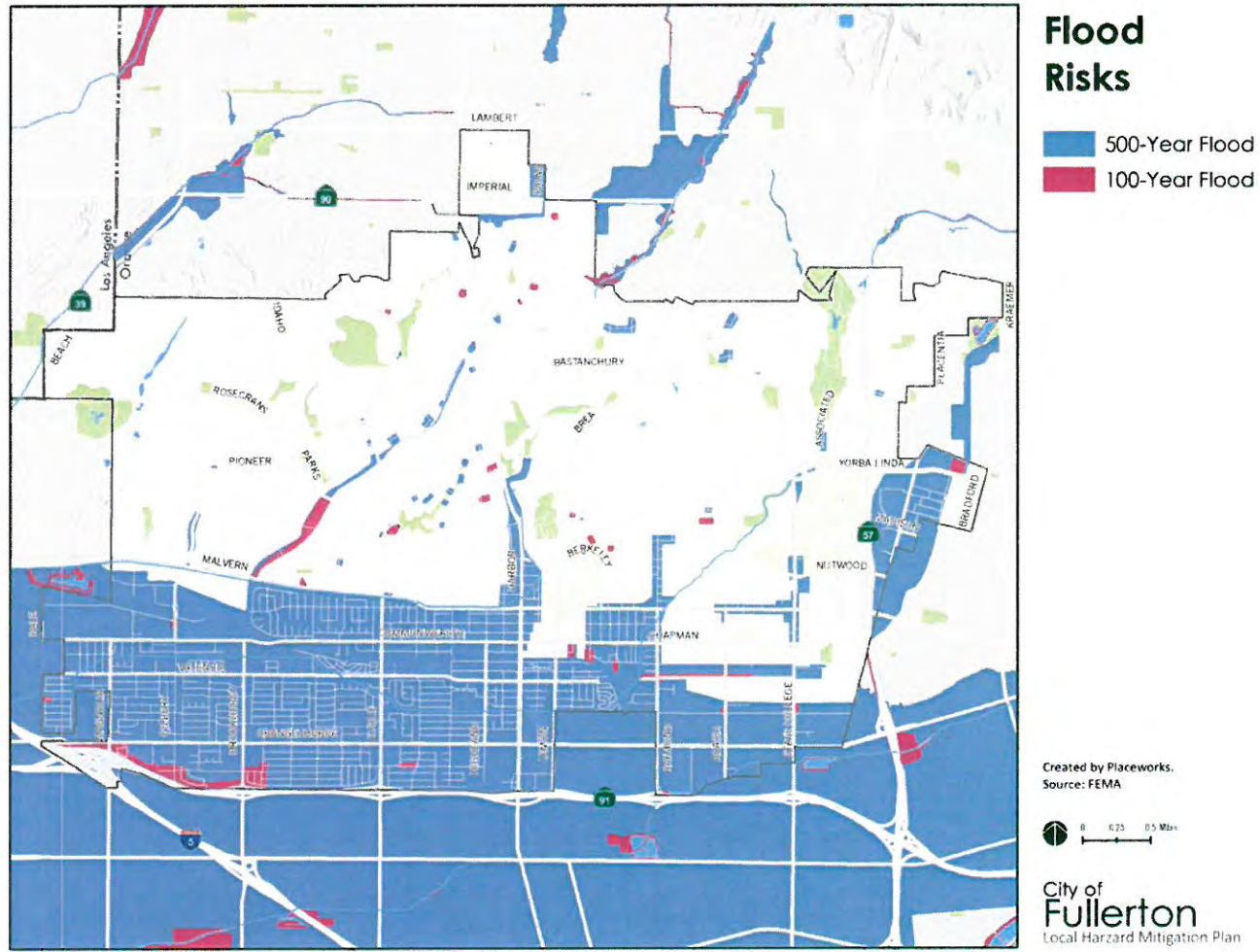


Exhibit 30 - FEMA Flood Zones



Map includes Letters of Map Revision through February 23, 2018

City of Fullerton

RESOLUTION CERTIFICATION

STATE OF CALIFORNIA)
COUNTY OF ORANGE) SS
CITY OF FULLERTON)

RESOLUTION NO. 2020-42


I, Lucinda Williams, City Clerk and ex-officio Clerk of the City Council of the City of Fullerton, California, hereby certify that the whole number of the members of the City Council of the City of Fullerton is five and that the City Council adopted the above and foregoing Resolution No. 2020-42 at a regular meeting of the City Council held May 19, 2020 by the following vote:

COUNCIL MEMBER AYES: Fitzgerald, Flory, Silva, Whitaker, Zahra

COUNCIL MEMBER NOES: None

COUNCIL MEMBER ABSTAINED: None

COUNCIL MEMBER ABSENT: None



Lucinda Williams, MMC
City Clerk

APPENDIX D

KEY FACILITIES INVENTORY

- Critical facilities list
- Facilities of concern list

This is a list of the names, address, and categorization of the 167 key facilities in Fullerton. The specific location of utilities facilities, such as energy or water infrastructure, are not disclosed for security reasons. Additionally, addresses are not given for some other facilities, predominately bridges. There are also 69 facilities of concern included in a separate table. A map showing the locations of all facilities is included in Chapter 4. Facilities whose location is confidential have been removed from the map.

Critical Facilities List

FACILITY NAME	FACILITY TYPE	FACILITY LOCATION MAPPED?	FACILITY ADDRESS
Southern California Edison	Energy	No	Location withheld
Southern California Edison	Energy	No	Location withheld
Las Palmas	Utility	No	Location withheld
Las Palmas	Utility	No	Location withheld
Hillcrest	Utility	No	Location withheld
Hillcrest	Utility	No	Location withheld
Upper Acacia	Utility	No	Location withheld
Upper Acacia	Utility	No	Location withheld
Upper Acacia	Utility	No	Location withheld
Upper Acacia	Utility	No	Location withheld
Lower Acacia	Utility	No	Location withheld
Lower Acacia	Utility	No	Location withheld
Lower Acacia	Utility	No	Location withheld
Lower Acacia	Utility	No	Location withheld
Lower Acacia	Utility	No	Location withheld
Lower Acacia	Utility	No	Location withheld
State College	Utility	No	Location withheld
State College	Utility	No	Location withheld

Kimberly2	Utility	No	Location withheld
Kimberly2	Utility	No	Location withheld
Kimberly2	Utility	No	Location withheld
Hermitage	Utility	No	Location withheld
Hermitage	Utility	No	Location withheld
Hermitage	Utility	No	Location withheld
Hermitage	Utility	No	Location withheld
Hermitage	Utility	No	Location withheld
Hermitage	Utility	No	Location withheld
Coyote	Utility	No	Location withheld
Coyote	Utility	No	Location withheld
Coyote	Utility	No	Location withheld
Hawks Point	Utility	No	Location withheld
Hawks Point	Utility	No	Location withheld
Laguna	Utility	No	Location withheld
Laguna	Utility	No	Location withheld
Tank Farm	Utility	No	Location withheld
Tank Farm	Utility	No	Location withheld
Carbon Canyon Dam	Water and Sewage	No	Location withheld
Prado Dam	Water and Sewage	No	Location withheld
Tank Farm-T5	Water and Sewage	No	Location withheld
Tank Farm-T4	Water and Sewage	No	Location withheld
Tank Farm-T3	Water and Sewage	No	Location withheld
Tank Farm-T2	Water and Sewage	No	Location withheld
Tank Farm-T1	Water and Sewage	No	Location withheld

Laguna	Water and Sewage	No	Location withheld
Hawks Pointe	Water and Sewage	No	Location withheld
Coyote	Water and Sewage	No	Location withheld
Hermitage	Water and Sewage	No	Location withheld
Kimberly No 2	Water and Sewage	No	Location withheld
State College	Water and Sewage	No	Location withheld
Upper Acacia-T2	Water and Sewage	No	Location withheld
Upper Acacia-T1	Water and Sewage	No	Location withheld
Lower Acacia	Water and Sewage	No	Location withheld
Hillcrest	Water and Sewage	No	Location withheld
Las Palmas	Water and Sewage	No	Location withheld
Kimberly	Water and Sewage	No	Location withheld
Christlieb	Water and Sewage	No	Location withheld
Sunclipse	Water and Sewage	No	Location withheld
Kimberly	Water and Sewage	No	Location withheld
Coyote	Water and Sewage	No	Location withheld
Airport	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Injection	Water and Sewage	No	Location withheld
Injection	Water and Sewage	No	Location withheld

Injection	Water and Sewage	No	Location withheld
Injection	Water and Sewage	No	Location withheld
Injection	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Extraction	Water and Sewage	No	Location withheld
Gilbert Neighborhood Center	Community Services	Yes	2120 W. Orangethorpe Ave
Garnet Neighborhood Center	Community Services	Yes	3012 Garnet Ln
Richman Neighborhood Center	Community Services	Yes	320 W Elm Ave
Fullerton Community Center/Boys and Girls Club of Fullerton (<i>Emergency shelter and cooling center</i>)	Emergency Gathering Areas	Yes	340 W Commonwealth Ave
Maple Neighborhood Center	Community Services	Yes	701 S Lemon St
Main Library	Community Services	Yes	353 W Commonwealth Ave
Station 2	Municipal Government	Yes	1732 W Valencia Dr
Station 5	Municipal Government	Yes	2555 E Yorba Linda Blvd
Station 6	Municipal Government	Yes	2691 Rosecrans Ave
Station 1	Municipal Government	Yes	312 E Commonwealth Ave
Station 4	Municipal Government	Yes	3251 N Harbor Blvd

Station 3	Municipal Government	Yes	700 S Acacia Ave
Police Station	Municipal Government	Yes	237 W Commonwealth Ave
Saint Jude Medical Center	Medical	Yes	101 E Valencia Mesa Dr
City Hall	Municipal Government	Yes	303 W Commonwealth Ave
City Yard	Municipal Government	Yes	1580 W Commonwealth Ave
Fullerton Museum Center	Museum	Yes	301 N. Pomona Ave.
Fullerton Airport	Transportation	Yes	4011 W Commonwealth Ave
55c0681	Transportation	Yes	0.0 Mi S/O Bastanchury Rd
55c0685	Transportation	Yes	0.05 Mi E. Raymond Ave
55c0298	Transportation	Yes	0.05 Mi E/O Acacia Ave
55c0296	Transportation	Yes	0.05 Mi S. Chapman Ave
55c0585	Transportation	Yes	0.1 M S. Commonwealth Av
55c0309	Transportation	Yes	0.1 M S/O Commonwealth Av
55c0229	Transportation	Yes	0.1 Mi E/O Harbor Blvd
55c0288	Transportation	Yes	0.1 Mi E/O Harbor Blvd
55c0525	Transportation	Yes	0.1 Mi E/O Lemon St
55c0386	Transportation	Yes	0.1 Mi N/O Chapman Ave
55c0147	Transportation	Yes	0.1 Mi N/O Valencia Dr
55c0234	Transportation	Yes	0.1 Mi N/O Valencia Dr
55c0292	Transportation	Yes	0.1 Mi N/O Valencia Dr
55c0383	Transportation	Yes	0.1 Mi N/O Valencia Drive

55c0233	Transportation	Yes	0.1 Mi S/O Commonwealth
55c0312	Transportation	Yes	0.1 Mi S/O Commonwealth
55c0385	Transportation	Yes	0.1 Mi S/O Commonwealth
55c0418	Transportation	Yes	0.1 Mi W/O Raymond Ave
55c0664	Transportation	Yes	0.1 Mi. S/O Commonwealth
55c0308	Transportation	Yes	0.11 Mi S/O Commonwealth
55c0311	Transportation	Yes	0.11 Mi S/O Commonwealth
55c0384	Transportation	Yes	0.15 Mi N/O Valencia Dr
55c0346	Transportation	Yes	0.15 Mi S/O Orangethorpe
55c0638	Transportation	Yes	0.15 Mi W/O Harbor Blvd.
55c0263	Transportation	Yes	0.1M N. Commonwealth Ave
55c0310	Transportation	Yes	0.2 Mi E/O Brookhurst Rd
55c0231	Transportation	Yes	0.2 Mi E/O Dale St
55c0297	Transportation	Yes	0.2 Mi N/O Nutwood Ave
55c0244	Transportation	Yes	0.2 Mi S/O Valencia Dr
55c0293	Transportation	Yes	0.2 Mi S/O Valencia Dr
55c0294	Transportation	Yes	0.2 Mi S/O Valencia Dr
55c0295	Transportation	Yes	0.2 Mi S/O Valencia Dr
55c0586	Transportation	Yes	0.3 Mi E/O Harbor Blvd
55c0307	Transportation	Yes	0.3 Mi N Orangethorpe Ave
55c0345	Transportation	Yes	0.3 Mi N/O Bastanchury
55c0242	Transportation	Yes	0.3 Mi N/O Orangethorpe
55c0235	Transportation	Yes	0.3 Mi W/O Euclid St
55c0584	Transportation	Yes	0.3 Mi W/O Harbor Blvd

55c0387	Transportation	Yes	0.4 Mi N/O Bastanchry Rd
55c0526	Transportation	Yes	0.8 Mi S/O Imperial Hwy
55c0243	Transportation	Yes	1/4 Mi N/O Orangethorpe
55c0120	Transportation	Yes	100' E/O Harbor Blvd
55c0224	Transportation	Yes	100' S/O Malvern Ave
55c0289	Transportation	Yes	100' S/O Malvern Ave
55c0290	Transportation	Yes	100' S/O Malvern Ave
55c0602	Transportation	Yes	100' S/O Malvern Ave
55c0236	Transportation	Yes	200' N/O Ash Ave
55c0230	Transportation	Yes	50' E/O Harbor Blvd
55c0225	Transportation	Yes	50' N/O Chapman Ave
55c0226	Transportation	Yes	50' N/O Chapman Ave
55c0227	Transportation	Yes	50' N/O Chapman Ave
55c0228	Transportation	Yes	50' N/O Chapman Ave
55c0232	Transportation	Yes	50' N/O Valencia Dr
55c0291	Transportation	Yes	At Woods Ave
55 0466	Transportation	Yes	Associated Road Uc
55 0465	Transportation	Yes	Bastanchury Road Uc
55 0456	Transportation	Yes	Chapman Avenue Uc
55 0502r	Transportation	Yes	E91/S5 Oh Separation
55 0503g	Transportation	Yes	E91-S5 Connector Oh
55 0287	Transportation	Yes	Gilbert Street Uc
55 0528	Transportation	Yes	Loftus Diversion Channel
55 0472s	Transportation	Yes	Magnolia Avenue Off-Ramp Oh

55 0296l	Transportation	Yes	Magnolia Avenue Uc
55 0296r	Transportation	Yes	Magnolia Avenue Uc
55 0296f	Transportation	Yes	Magnolia Avenue Uc (W91-N5 Hov)
55 0464	Transportation	Yes	Nutwood Avenue Uc
55 0483	Transportation	Yes	Rolling Hills Dr Uc
55 0293l	Transportation	Yes	W91/5 Separation & Oh
55 0468	Transportation	Yes	Yorba Linda Blvd Oc
Transportation Center	Transportation	Yes	120 E Santa Fe Ave
Yorba Linda Pump Station	Utility	Yes	2600 E Yorba Linda Blvd
Brea Dam	Water and Sewage	Yes	Brea Reservoir
Fullerton Dam	Water and Sewage	Yes	Fullerton Lake
Independence Park (<i>Back-up Shelter, Gym, Swim Complex, City-designated emergency event morgue</i>)	Emergency Gathering Areas	Yes	801 W. Valencia Ave.
Fullerton Tennis Center (<i>Emergency triage for St. Jude Medical Center</i>)	Emergency Gathering Areas	Yes	110 E. Valencia Mesa Dr.
Amerige Stadium (<i>Emergency animal shelter for small animals</i>)	Emergency Gathering Areas	Yes	304 W. Commonwealth
Laguna Lake Equestrian Center (<i>Emergency shelter for horses and other livestock. Operated by Fullerton recreational riders.</i>)	Emergency Gathering Areas	Yes	3120 Lakeview Dr.

Facilities of Concern List

FACILITY NAME	FACILITY TYPE	FACILITY LOCATION MAPPED?	FACILITY ADDRESS
Buena Park High School	Education	No	8833 Academy Dr
Fullerton Union High School	Education	Yes	201 E Chapman Ave
La Habra High School	Education	No	801 W Highlander Ave
La Sierra High School	Education	Yes	951 N State College Blvd
La Vista High School	Education	Yes	909 N State College Blvd
Sonora High School	Education	No	401 S Palm St
Sunny Hills High School	Education	Yes	1801 Warburton Way
Troy High School	Education	Yes	2200 E Dorothy Ln
Acacia Elementary School	Education	Yes	1200 N Acacia Ave
Beechwood School	Education	Yes	780 Beechwood Ave
Commonwealth Elementary School	Education	Yes	2200 E Commonwealth Ave
Fern Drive Elementary School	Education	Yes	1400 W Fern Dr
Robert C. Fisler School	Education	Yes	1350 Starbuck St
Golden Hill Elementary School	Education	Yes	732 Barris Dr
Hermosa Drive Elementary School	Education	Yes	400 E Hermosa Dr

Ladera Vista Junior High School Of The Arts	Education	Yes	1700 E Wilshire Ave
Laguna Road Elementary School	Education	Yes	300 Laguna Rd
Maple Elementary School	Education	Yes	244 E Valencia Dr
Nicolas Junior High School	Education	Yes	1100 W Olive Ave
Orangethorpe Elementary School	Education	Yes	1400 S Brookhurst Rd
Pacific Drive Elementary School	Education	Yes	1501 W Valencia Dr
Parks Jr High School	Education	Yes	1710 Rosecrans Ave
Raymond Elementary School	Education	Yes	517 N Raymond Ave
Richman Elementary School	Education	Yes	700 S Richman Ave
Rolling Hills Elementary School	Education	Yes	1460 E Rolling Hills Dr
Sunset Lane Elementary School	Education	Yes	2030 Sunset Ln
Valencia Park Elementary School	Education	Yes	3441 W Valencia Dr
Woodcrest Elementary School	Education	Yes	455 W Baker Ave
California State University, Fullerton	Education	Yes	800 N State College Blvd
Fullerton College	Education	Yes	321 E Chapman Ave
Hope University	Education	Yes	2500 E Nutwood Ave
Marshall B. Ketchum	Education	Yes	2575 Yorba Linda

University			Blvd
Ruby Drive Elementary	Education	No	601 Ruby Dr
Sierra Vista Elementary School	Education	No	1811 N Placentia Ave
Topaz Elementary School	Education	Yes	3232 Topaz Ln
Kids Adventure Learning Center	Education	Yes	1834 West Valencia Dr
Stepping Stones Academy	Education	Yes	3401 N Harbor Blvd
St Juliana Falconieri School	Education	Yes	1320 N Acacia Ave
Arborland Montessori School - Valencia Campus	Education	Yes	1700 W Valencia Dr
Arborland Montessori School - Hughes Campus	Education	Yes	2121 Hughes Dr
Ivycrest Montessori	Education	Yes	2025 E Chapman Ave
Eastside Christian	Education	Yes	1701 W Valencia Dr
Rosary Academy	Education	Yes	1340 N Acacia Ave
James A. Whitaker Elementary	Education	No	8401 Montana Ave
Women'S Transitional Living Center	Community Services	No	Confidential
Santa Ana Armory Cold Weather Shelter	Community Services	No	400 South Brookhurst Road
New Vista Immediate Response Housing	Community Services	No	Confidential
Sunnycrest Senior Living	Medical	Yes	1925 Sunny Crest Dr
Sunrise of Fullerton	Medical	Yes	2226 N Euclid St

Park Vista	Medical	Yes	2525 N Brea Blvd
Acacia Villas Assisted Living	Medical	Yes	1620 E Chapman Ave
Cambridge Court Assisted Living	Medical	Yes	1621 E Commonwealth Ave
Fullerton Rosewood Assisted	Medical	Yes	411 E Commonwealth Ave
Oasis Assisted Senior Living	Medical	Yes	1950 Sunny Crest Dr
Glencrest Manor	Medical	Yes	2401 Thorn Pl
Applecrest Homes Assisted Living	Medical	Yes	713 San Ramon Dr
Glenwood Care Assisted Living	Medical	Yes	2001 E Glenwood Ave
D'Best Care Board and Care	Medical	Yes	3608 W Ash Ave
Senior Living Community	Medical	Yes	312 N Roosevelt Ave
Cherub Home	Medical	Yes	2100 Carol Dr
Fullerton Gardens	Medical	Yes	1510 E Commonwealth Ave
Kindred Hospital Brea - Subacute	Medical	Yes	875 N. Brea Blvd.
Gordon Lane Convalescent Hospital	Medical	Yes	1821 E. Chapman Ave.
Terrace View Care Center	Medical	Yes	201 E. Bastanchury Rd.
The Pavilion at Sunny Hills	Medical	Yes	2222 N. Harbor

			Bldv.
Windsor Garden of Fullerton	Medical	Yes	245 E. Wilshire Ave.
Genesis - St. Elizabeth Healthcare and Rehabilitation Center	Medical	Yes	2800 N. Harbor Blvd.
Greenfield Care Center	Medical	Yes	330 W. Bastanchury Rd.
Park Vista at Morningside	Medical	Yes	2525 Brea Blvd.

APPENDIX E

IMPLEMENTATION WORKBOOK

- Local Hazard Mitigation Plan Implementation Workbook

CITY OF FULLERTON

***Local Hazard Mitigation Plan
Implementation Workbook***

APRIL 10, 2019

WHAT IS THIS WORKBOOK?

The Local Hazard Mitigation Plan (LHMP) for the City of Fullerton features an evaluation of Fullerton's hazards as well as a variety of hazard mitigation actions corresponding to each hazard type. These actions are intended to preserve public safety, maintain critical municipal government operations and services when hazard events emerge, and empower community members to take hazard mitigation actions on an individual level. This Implementation Workbook (Workbook) is intended for use by City staff and decision makers after the LHMP is adopted. It will:

- Give clear instructions as to what to following adoption of the LHMP.
- Simplify future updates to the LHMP.
- Assist the City in receiving grant funding relating to mitigation action.
- Guide annual plan review actions.

HOW DO I USE THIS WORKBOOK?

This Workbook can help City staff and decision makers in several different situations. If and when the events listed below occur, consult the respective sections of this Workbook for advice on how best to proceed:

- A disaster declaration has been announced
 - By the Fullerton City Council
 - By the State of California
 - By the federal government
- I want to apply for mitigation grant funding
- Fullerton is undergoing its budgeting process
- Fullerton is holding its annual meeting of the Hazard Mitigation Planning Team
- Fullerton is updating its policy and regulatory documents
 - The Local Hazard Mitigation Plan
 - The Safety Element of the General Plan
 - The Housing Element of the General Plan
 - The Municipal Code

WHO MAINTAINS THIS WORKBOOK?

The leader of the Hazard Mitigation Planning Committee (HMPC) is the one responsible for maintain this Workbook. At the time of writing, the current HMPC leader is Heather Allen, from the Community Development Department. The HMPC may delegate this responsibility to someone else should they so choose.

WHAT TO DO WHEN A DISASTER HAS BEEN PROCLAIMED OR DECLARED

Disasters may be proclaimed or declared by the Fullerton City Council, the State of California, or the federal government. Responsibilities may differ depending on who proclaims or declares the disaster. If multiple organizations proclaim or declare a disaster, consult all applicable lists.

THE FULLERTON CITY COUNCIL

If the Fullerton City Council (or the designated city official, if the City Council is not in session) proclaims a Local Emergency, take the following steps:

- Update **Attachment 1** with information about the disaster. Include information about cumulative damage, including any damage outside of Fullerton.
- Discuss opportunities for local assistance with the representatives from the California Office of Emergency Services (Cal OES).
- If the disaster damages local infrastructure or City-owned facilities, repair or rebuild the structure to be more resilient, following applicable hazard mitigation actions. A list of actions, organized by hazards, is included as **Attachment 4**.
- Chapter 6** of the Fullerton LHMP states that the City should consider updating the LHMP if a disaster causes a loss of life in the community, even if there is no state disaster proclamation or federal disaster declaration that includes part or all of Fullerton. If there is a loss of life in Fullerton, consider updating the LHMP. Consult the section on updating the LHMP in this Workbook for details.

THE STATE OF CALIFORNIA

If the State of California proclaims a disaster for Fullerton, or an area that includes part or all of Fullerton, take the following steps:

- Update **Attachment 1** with information about the disaster. Include information about cumulative damage, including any damage outside of Fullerton.
- Collaborate with representatives from Cal OES to assess the damage from the event.
- Discuss opportunities for local assistance with representatives from Cal OES.
- If the disaster damages local infrastructure or City-owned facilities, repair or rebuild the structure to be more resilient, following applicable hazard mitigation actions. A list of actions, organized by hazards, is included as **Attachment 4**.
- If the disaster may escalate into a federal disaster declaration, begin any necessary coordination with representatives from the Federal Emergency Management Agency (FEMA).
- Chapter 6** of the Fullerton LHMP states that the City should consider updating the LHMP if a disaster leads to a state disaster proclamation or federal disaster declaration that includes

part or all of Fullerton, even if there is no loss of life. Consider updating the LHMP. Consult the section on updating the LHMP in this Workbook for details.

THE FEDERAL GOVERNMENT

If the federal government declares a disaster for Fullerton, or any area that includes part or all of Fullerton, take the following steps:

- Update **Attachment 1** with information about the disaster. Include information about cumulative damage, including any damage outside of Fullerton.
- Collaborate with representatives from Cal OES and FEMA to assess the damage from the event.
- Determine if Fullerton will be eligible for public assistance funds related to the federal disaster declaration. These funds can be used to reimburse the City for response and recovery activities. If the City is eligible, work with FEMA and Cal OES representatives to enact the necessary requirements and receive funding.
- If the disaster damages local infrastructure or City-owned facilities, repair or rebuild the structure to be more resilient, following applicable hazard mitigation actions. A list of actions, organized by hazards, is included as **Attachment 4**.
- The Hazard Mitigation Grant Program (HMGP) is a FEMA program that helps fund hazard mitigation activities after a disaster event. Fullerton may be eligible for funding because of the federal disaster declaration, although not all activities may meet the program's requirements. If Fullerton is eligible, work with FEMA to apply for this funding. Some of the criteria and eligible projects are featured below:
 - **Acquisition and Structure Demolition** – used to take any hazardous structures through eminent domain and dismantle them
 - **Dry Floodproofing of Historic Residential Structures** – used to prevent floodwater from entering historic buildings
 - **Elevation of a structure** – used to raise structures above floodwater levels
 - **Writing or Updating a Hazard Mitigation Plan** – used to draft a new or an update an existing LHMP
 - **Wildfire mitigation** – used to re-clad structures with fire-resistant materials and clear flammable vegetation (fire-resistant materials, clearance of flammable vegetation)
 - **Wind protection** – used to reinforce the roof, walls, doors, and other structural elements from high wind speed.

In order to be eligible for funding through the Hazard Mitigation Grant Program each project needs to demonstrate it:

- Conforms with the approved state and local mitigation plan
- Benefits the disaster area
- Abides by existing environmental regulations

- Resolves a problem and is technically feasible
 - Follows all applicable state and local codes and standards
 - Is cost-effective
 - Provides a range of alternative solutions
- Chapter 6** of the Fullerton LHMP states that the City should consider updating the LHMP if a disaster leads to a state disaster proclamation or federal disaster declaration that includes part or all of Fullerton, even if there is no loss of life. Consider updating the LHMP. Consult the section on updating the LHMP in this Workbook for details.

I WANT TO APPLY FOR MITIGATION GRANT FUNDING

There are three potential grant funding programs that FEMA administers for hazard mitigation activities. Two of these programs, the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) funding sources, are available to communities with a LHMP that complies with FEMA guidelines and has been adopted within the past five years. The third funding program is the Hazard Mitigation Grant Program (HMGP), which is available for communities that are part of a federal disaster declaration. This section discusses the PDM and FMA programs, and how to apply for them. The HMGP is discussed under the “Federal Government” subsection of the above “What to Do When a Disaster Has Been Proclaimed or Declared” section.

PRE-DISASTER MITIGATION

The PDM grant program is a competitive, nation-wide program that awards funding for planning activities and physical development programs that mitigate against future natural hazards. Development projects must be identified in a hazard mitigation plan that meets FEMA guidelines and was adopted within the past five years. When applying to this program, review the list of hazard mitigation actions in **Attachment 4** to see which projects may be eligible. Planning efforts for communities that lack a valid hazard mitigation plan may be eligible for funding if the effort would create a valid hazard mitigation plan. All PDM grant applications are processed through the State. To learn more, consult with Cal OES representatives or visit the FEMA webpage on the program. At time of writing, this webpage is available at <https://www.fema.gov/pre-disaster-mitigation-grant-program>.

Take the following steps to apply for PDM funding:

- Confirm that the program is currently accepting funding applications. Check with representatives from Cal OES or consult the Cal OES webpage on the PDM program. At time of writing, this webpage is available at <http://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/pre-disaster-flood-mitigation>.
- Identify the actions from the hazard mitigation strategy (see **Attachment 4**) that call on the City to pursue funding or list grants as a potential funding source. Confirm that the actions are consistent with the requirements of the PDM grant.

- Coordinate with Cal OES representatives to compile and submit materials for the grant application.

FLOOD MITIGATION ASSISTANCE

The FMA grant program is a competitive, national program that awards funding for physical development projects and planning efforts that mitigate against long-term damage from flooding. The funding is only available to communities that participate in the National Flood Insurance Program (NFIP), which Fullerton currently does. Communities must also have a valid hazard mitigation plan that meets FEMA guidelines in order to be eligible, and all projects must be consistent with the list of actions in the hazard mitigation strategy. When applying to this program, review the list of hazard mitigation actions in **Attachment 4** to see which projects may be eligible. As with the PDM program, applications for the FMA program must be processed through the State. To view more information, consult with Cal OES representatives or visit the FEMA webpage on the program. At time of writing, this webpage is available at <https://www.fema.gov/flood-mitigation-assistance-grant-program>.

Take the following steps to apply for FMA funding:

- Confirm that the program is currently accepting funding applications. Check with representatives from Cal OES or consult the Cal OES webpage on the FMA program. At time of writing, this webpage is available at <http://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/pre-disaster-flood-mitigation>.
- Identify the actions from the hazard mitigation strategy (see **Attachment 4**) that call on the City to pursue funding or list grants as a potential funding source. Confirm that the actions are consistent with the requirements of the FMA grant.
- Coordinate with Cal OES representatives to compile and submit materials for the grant application

FULLERTON IS GOING THROUGH THE BUDGETING PROCESS

Fullerton's budget process is an ideal opportunity to secure funding for hazard mitigation actions, and to ensure that hazard mitigation efforts are incorporated into the City's fiscal priorities. Fullerton currently operates on an annual budget cycle that runs from July 1 to June 30. During this process, City staff should take the following steps to incorporate hazard mitigation into Fullerton's annual budget:

- Include hazard mitigation actions into Fullerton's list of Capital Improvement Projects (CIP). Review the list of hazard mitigation actions in **Attachment 4** and identify the projects that can be included into the list of CIP or can support efforts in the list of CIP.
- Review the risk and threat assessments in the LHMP (**Chapter 3** and **Chapter 4**) to ensure that all items in the list of CIP are being planned, designed, and constructed so as to minimize the threat from hazard events.
- Identify opportunities to identify stand-alone hazard mitigation actions through the annual budget process. Include appropriate items from **Attachment 4** in the budget as stand-alone

line items, particularly items that the Hazard Mitigation Planning Committee (Planning Committee) considered a high priority.

- Identify staff to research, prepare, and submit PDM and FMA grant opportunities and/or provide support to grant writers (consult the “I Want to Apply for Mitigation Grant Funding” section above).
- Ensure that implementation of hazard mitigation actions are reflected in each relevant department’s priorities.

FULLERTON IS CONDUCTING ITS ANNUAL MEETING OF THE HAZARD MITIGATION PLANNING TEAM

The hazard mitigation planning process brings together representatives from multiple City agencies, as well as other relevant stakeholders, and provides a forum to discuss the hazards in Fullerton and how to mitigate them effectively. As mentioned in **Chapter 6** of the LHMP, the Planning Committee should meet at least once each year, beginning a year after the LHMP is adopted. During these meetings, the Planning Committee should discuss implementation progress and integration of hazard mitigation actions in other City documents. At these meetings, the Planning Committee can review the status of the hazard mitigation actions and discuss whether completed or in-progress actions are working as expected. These meetings also allow the Planning Committee to strategically plan for the upcoming year.

It may help for the Planning Team to meet early in the year, in advance of annual budget activities. **Attachment 3** contains an example of Planning Team meeting agenda.

The annual meeting should include representatives from City departments and other organizations that originally prepared the LHMP. Representatives from other relevant organizations should also be invited. During the preparation of the LHMP, the following agencies were part of the Planning Team:

- Fullerton College
- Fullerton Community Development Department
- Fullerton Fire Department
- Fullerton Human Resources Department
- Fullerton Joint Unified School District
- Fullerton Parks and Recreation Department
- Fullerton Police Department
- Fullerton Public Works Department
- Fullerton School District
- California State University, Fullerton
- Caltrans
- City of La Habra
- City of Placentia
- Fullerton College
- Fullerton Joint Unified School District
- Metropolitan Water District

- Orange County Health Care Agency
- Orange County Sanitation District
- St. Jude Medical Center

Other organizations that should be invited to future consultations and updates to the Plan include:

- Orange County Fire Authority
- Orange County Intelligence and Assessment Center
- Orange County Parks
- Orange County Public Works
- Orange County Sanitation District
- Orange County Sheriff’s Department

In advance of Planning Committee meetings, consider using **Attachment 1** to maintain an accurate list of recent disaster events that have occurred in and around Fullerton since the LHMP was adopted. At the Planning Committee meeting, review the Plan Maintenance Table (**Attachment 2**) to identify any gaps in the LHMP or any other component of the Plan that needs updating. This also allows Planning Committee members the opportunity to review the actions in the hazard mitigation strategy (**Attachment 4**) and ensure that they are implemented as intended.

FULLERTON IS UPDATING ITS POLICY AND REGULATORY DOCUMENTS

If Fullerton is updating the LHMP, the Safety Element or Housing Element of the General Plan consult the following applicable section.

LOCAL HAZARD MITIGATION PLAN

All LHMPs should be updated every five years. This helps keep the plan up to date and ensures that it reflects the most recent guidance, requirements, science, and best practices. An updated LHMP also helps keep Fullerton eligible for hazard mitigation grants that require a valid, recent LHMP (see “I Want to Apply for Mitigation Grant Funding”), along with an increased amount of post-disaster recovery funds.

The update process for the LHMP takes approximately one year. To ensure that a new LHMP comes into effect before the previous one expires, the update process should begin no later than four years after the plan is adopted. Updates may occur sooner at the City’s discretion. Potential reasons for updating the LHMP sooner may include a state disaster proclamation or federal disaster declaration that covers part or all of Fullerton, or if a disaster leads to a loss of life in Fullerton (see the “What to Do When a Disaster Has Been Proclaimed or Declared” section), as discussed in **Chapter 6** of the LHMP.

Take the following steps to update the LHMP:

ASSEMBLE THE HAZARD MITIGATION PLANNING COMMITTEE

- Convene a Planning Committee meeting no later than four years after the LHMP is adopted. Invite the regular Planning Team members, along with representatives from other organizations that may have a role to play in the update process.
- Review the current status of mitigation actions, including if there are any that are not being implemented as planned or are not working as expected. Determine if there have been any changes in hazard events, regulations, best practices, or other items that should be incorporated into an updated LHMP.
- Decide if there is a need for a technical consultant to assist with the LHMP update, and conduct consultant selection activities if needed. If a consultant is desired, the selection process should begin a few months before the update gets underway.
- Create and implement a community engagement strategy, building off of the strategy prepared for the existing LHMP. Describe in-person and online engagement strategies and materials, including ideas for meetings and workshops, draft community surveys, content for websites and press releases, and other materials that may be useful.

UPDATE THE RISK AND THREAT ASSESSMENTS

- Review and update the risk assessment to reflect the most recent conditions in Fullerton. Consider recent hazard events, new science associated with hazards and climate change, new development and land use patterns, and other recent changes on local conditions.
- Evaluate the status of all key facilities. Update the list if new facilities that have been constructed, or if existing facilities have been decommissioned. Re-assess the threat to key facilities.
- Review the demographics of community residents, and update the threat assessment for vulnerable populations and other community members.
- Assess any changes to the threat to all other community assets, including key services, other facilities, and economic drivers.

UPDATE THE MITIGATION ACTIONS

- Update the existing hazard mitigation actions to reflect actions in progress. Remove actions that have been completed, or revise them to increase their effectiveness. Revise actions that have been abandoned or delayed so as to make them more feasible, or remove them from the list of mitigation actions if they are no longer appropriate for Fullerton.
- Develop mitigation actions to improve the status of hazard mitigation activities in Fullerton by addressing any issues not covered by the existing LHMP.
- Ensure that the feedback from the community engagement activities are reflected in the new and updated mitigation actions.

REVIEW AND ADOPT THE UPDATED PLAN

- Review the other chapters and appendices of the LHMP to reflect any changes made through the update process.
- Release the updated Plan to Planning Committee members, and revise the Plan to reflect any comments by Planning Committee members.
- Distribute the updated Plan to any appropriate external agencies not included in the Planning Committee, and revise the plan as appropriate in response to any comments.
- Release the updated Plan publicly for review, and make revisions to the Plan to reflect public comments.
- Submit the plan to Cal OES and FEMA for approval, and make any revisions as needed.
- Submit the plan to the Fullerton City Council for adoption.

THE SAFETY ELEMENT OF THE GENERAL PLAN

The Safety Element is a required component of Fullerton’s General Plan. It can be updated as a stand-alone activity, or as part of a more comprehensive process to update multiple sections or all of the General Plan. The Safety Element does not need to be updated on any set schedule, but updates should be frequent enough for the element to remain current and applicable to the community.

Local communities can incorporate their LHMP into their Safety Element as allowed under Section 65302.6 of the California Government Code, as long as the LHMP meets minimum federal guidelines. This allows communities to be eligible for an increased share of post-disaster relief funding from the State if a hazard situation occurs, as per Section 8685.9 of the California Government Code.

Take the following steps to incorporate the LHMP into the Safety Element:

INCORPORATE NEW REQUIREMENTS INTO THE SAFETY ELEMENT, AND ENSURE THAT THE LHMP IS CONSISTENT WITH THE SAFETY ELEMENT

- Review the requirements for Safety Elements in Section 65302(g)(1) of the California Government Code, and for LHMPs in Section 65302.6 of the California Government Code. Ensure that both documents meet all state requirements.
- Ensure that the information in both plans do not contradict each other, and that any inconsistencies are corrected to use the most accurate and appropriate information. This information should include community descriptions, risk assessment, and threat assessment.
- Ensure that the policies in the Safety Element support the LHMP and provide a planning framework for specific hazard mitigation actions.

THE HOUSING ELEMENT OF THE GENERAL PLAN

The Housing Element is a required component of Fullerton’s General Plan. Section 65583 of the California Government Code requires a Housing Element to analyze and plan for new residential growth in a

community, including residential growth for households with an annual income below the area median. Similar to an LHMP, state regulations require that the Housing Elements be updated regularly to remain current and valid.

The Housing Element is not required to contain any information or policies that relate to hazards, although it may include policies that address retrofitting homes to improve resiliency. However, state law links the regular schedule of Housing Element updates to mandatory revisions to other General Plan elements. For example, Section 65302(g)(2) of the California Government Code requires that communities that update their Housing Element on or after January 1, 2009 also update their Safety Element to include specific information and policies related to flood protection. As the LHMP is incorporated into the Safety Element, updates to the Housing Element may indirectly trigger updates to the LHMP.

To update the LHMP concurrent with updates to the Housing Element, take the following steps:

ENSURE THAT THE LHMP MEETS ANY NEW REQUIREMENTS FOR THE SAFETY ELEMENT THAT MAY BE TRIGGERED BY A HOUSING ELEMENT UPDATE

- Section 65302(g) of the California Government Code lists a number of requirements for the Safety Element of the General Plan. Some of these requirements are triggered by updates to the Housing Element. Check to see if there are any new requirements of this nature. Note that the requirement is linked to the date of adoption of the new Housing Element, not the date the update process begins.
- Because the LHMP is incorporated into the Safety Element, any amendments or revisions to the Safety Element triggered by the Housing Element update may be made directly in the LHMP. Requirements triggered by the Housing Element are unlikely to require a full rewrite of the LHMP, but the process should fully involve the Planning Committee and include appropriate community engagement.
- Adopt the updated LHMP and incorporate it into the Safety Element. If necessary, amend the Safety Element to ensure the two documents are consistent (review the “Incorporate New Requirements Into the Safety Element, and Ensure that the LHMP is Consistent with the Safety Element” subsection above).

THE FULLERTON MUNICIPAL CODE

Fullerton’s Municipal Code contains a set of standards that guide land uses and development in the community. These standards include where different types of buildings and land use activities may be located, how these structures must be built, and how they must be operated or maintained. The Municipal Code may include requirements that structures (particularly new structures or those undergoing substantial renovations) incorporate hazard-resistant features, be located outside of the most hazard-prone areas, or take other steps to reduce hazard vulnerability.

All communities in California are required to adopt the minimum state Building Standard Code (BSC), which includes some hazard mitigation requirements for new or significantly renovated structures. The BSC is generally updated every three years, with supplemental code updates halfway into each update cycle. Title 14 of Fullerton’s Municipal Code (Buildings and Construction), Chapter 14.03 (Building Code),

Article 14.03.010. (California Building Code Adopted.) incorporates the BSC, along with additional standards as desired by the City that adapt the BSC to Fullerton’s local context.

As a participant in the National Flood Insurance Program (NFIP), Fullerton is required to include a Floodplain Management section in its Municipal Code, which is included in the Municipal Code, Title 14, Chapter 14.01, as the City’s Floodplain Management Regulations. These regulations establish standards for development and operation of facilities within mapped flood-prone areas.

With the exception of the Floodplain Management Regulations and the minimum standards in the BSC, Fullerton is not required to incorporate hazard-related requirements in the Municipal Code. Substantial updates to the Municipal Code, including the Buildings and Construction and Zoning Code sections, should be done in a way that is consistent with the LHMP.

INCLUDE HAZARD-RELATED REQUIREMENTS IN APPLICABLE SECTIONS OF THE FULLERTON CODE OF ORDINANCES

- If the BSC is being updated, evaluate the hazard-related requirements of all sections in the new BSC. Identify any areas where it may be feasible to add or revise standards to help reduce the threat from hazard events. Ensure that these standards are consistent with the LHMP. Consider whether standards should be applied to all structures, or to specific types of structures or to structures in a limited area (such as a flood plain).
- If the Zoning Code is being updated, ensure that all requirements do not expose community members or community assets to an excessive risk of harm. Where feasible, use the requirements to strengthen community resiliency to hazard events. Ensure that these standards are consistent with the LHMP. Consider possible standards such as overlay zones that strengthen zoning requirements in hazard-prone areas, landscaping and grading requirements that buffer development from hazards, siting and design standards that make structures more resilient, and other strategies as appropriate.

ATTACHMENT 1: DISASTER INFORMATION TABLE

Use this table to fill out information about any disaster events that have occurred in Fullerton or nearby, and have had an effect on the community. Include the date and location of the disaster event, the damages associated with the event, and any information about disaster proclamations or declarations resulting from the event.

DATE	LOCATION	DAMAGES *	DECLARATION DETAILS †

* Includes number and type of injuries, number of deaths, and cost of physical damage
† If the disaster was proclaimed or declared by the local, state, and/or federal government

ATTACHMENT 2: PLAN MAINTENANCE TABLE

Use this table when reviewing the LHMP as part of the Planning Committee’s annual activities. For each section of the LHMP, note if any changes should be made to make the Plan more effective for the community. This includes noting if anything in the LHMP is incorrect or if any important information is missing. Make revisions that are consistent with these notes as part of the next update to the LHMP.

SECTION	IS ANYTHING INCORRECT?	IS ANYTHING MISSING?	SHOULD ANY OTHER CHANGES BE MADE?
Multiple sections or throughout			
Chapter 1: Introduction			
Chapter 2: Community Profile			
Chapter 3: Risk Assessment			
Chapter 4: Threat Assessment			
Chapter 5: Mitigation Strategy			
Chapter 6: Plan Maintenance			
Appendices			

ATTACHMENT 3: SAMPLE AGENDA AND TOPICS FOR THE HAZARD MITIGATION PLANNING TEAM

This attachment includes a sample agenda and discussion topics for the annual meeting of the Planning Committee. Meetings do not have to follow this order or structure, but the items included in this attachment should be addressed as part of the annual meeting. During the update process for the LHMP, it is likely that the Planning Committee will meet more frequently. The meetings of the Planning Committee during the update process will involve different discussion topics.

Item 1: Recent hazard events

1.1. What hazard events have occurred this past year in Fullerton, or nearby in a way that affected the community?

- Identify events that caused loss of life or significant injury to Fullerton community members, significant property damage in Fullerton, or widespread disruption to Fullerton.
- More minor events should also be identified if there is a need for a community response to mitigate against future such events.

1.2. What are the basic facts and details behind any such hazard events?

- Consider the size and location of the affected area, any measurements of severity, any injuries and deaths, the cost of any damage, the number of people displaced or otherwise impacted, and other relevant summary information.
- Ensure that these facts and details are clearly recorded for future Plan updates, including through use of the Disaster Information Table (**Attachment 1**).

Items 2: Mitigation action activities

2.1. What mitigation actions have been fully implemented? Are they working as expected, or do they need to be revised?

2.2. What mitigation actions have started to be implemented since the Planning Team last met? Is implementation of these actions proceeding as expected, or are there any barriers or delays? If there are barriers or delays, how can they be removed?

2.3. What mitigation actions are scheduled to begin implementation in the next year? Are there any factors that could delay implementation, or weaken the effectiveness of the actions? How can these factors be addressed?

2.4. What resources are needed to support planned, in-process, or ongoing mitigation actions? Does the City have access to these resources? If not, how can the City obtain access to these resources?

Item 3: Information sharing

3.1. Is the City communicating with all appropriate local jurisdictions, including neighboring communities, Orange County, and special districts? This should include information on district-specific hazard situations, mitigation actions, and other relevant information.

- 3.2. Is the communicating with the appropriate state and federal agencies? Is the City receiving information about new regulations, best practices, and data that relates to hazard mitigation activities?
- 3.3. Are there opportunities for the City to improve coordination with local, state, and federal jurisdictions and agencies?

Item 4: Budgetary planning

- 4.1. What are the financial needs for Fullerton to support implementation of planned and in-process mitigation actions, including ongoing items? Is there sufficient funding for all measures in the LHMP that are planned for the next year, including in-process and ongoing items? If sufficient funding is not available, how can the City obtain these funds?
- 4.2. If it is not feasible for the City to support all planned, in-process, or ongoing mitigation actions, which ones should be prioritized?
- 4.3. Are there hazard-related activities not included in the LHMP that should be budget for? Can the City obtain the necessary funding for these activities?

Item 5: Strategic planning

- 5.1. Which grants are available for hazard mitigation activities, and which activities are best positioned to secure funding?
- 5.2. How should the agencies and other organizations represented on the Planning Team coordinate to maximize the chances of receiving funding?
- 5.3. Are there any scheduled or anticipated updates to other City documents that could relate to hazard mitigation activities? How can the Planning Team share information with staff and any technical consultants responsible for these updates, and ensure that the updates will enhance community resiliency?
- 5.4. What capital projects are scheduled or anticipated? Are these capital projects being designed and built to be resistant to hazard events? Are there opportunities for these projects to support hazard mitigation activities?
- 5.5. How can Planning Team members coordinate efforts with those responsible for capital projects to take advantage of economies of scale that will make hazard mitigation activities easier to implement?
- 5.6. Has it been four years since the adoption of the LHMP? If so, lay out a timeline for Plan update activities, including additional meetings of the Planning Team. Identify if a technical consultant is needed, and begin the contracting process if so.
- 5.7. Are there any other opportunities for Planning Committee members and the organizations they represent to coordinate efforts?
- 5.8. Are there any pieces of infrastructure the City needs to update or any programs the City wants to launch that could also be eligible for a Hazard Mitigation Grant? (See potential list below):
 - a. Structure acquisition and demolition
 - b. Structure elevation
 - c. Wildfire fuel abatement

Items 6: New business

6.1. Are there any other items related to the Planning Committee's mission?

There is no content on this page.

ATTACHMENT 4: HAZARD MITIGATION STRATEGY

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ¹
Preparedness Activities						
P.1	Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Fullerton Public Library, and any others that the City may so designate in the future.	General Fund, Grants	Public Works	Low	2022	High (5)
P.2	Update the Community Forest Master Plan, incorporating drought strategies and wildfire vulnerabilities into the planning framework.	General Fund, Grants	Public Works (Landscape Maintenance Division)	Low	2022	Medium (3)
P.3	Hire a full-time Emergency Operations Coordinator for Fullerton.	General Fund, Grants	City Manager, Human Resources	High	2022	Medium (1)
P.4	Continuously research, prepare, and submit applications for hazard mitigation grants.	General Fund, Grants	All	Low	Ongoing	Low (0)
P.5	Update Safety Element to incorporate the 2019 Local Hazard Mitigation Plan.	General Fund, Grants	Community Development	Low	2020	Low (0)
P.6	Develop a communications plan and protocol to immediately disseminate information about potential hazard conditions to all City staff and to residents and businesses in potentially affected areas (alert homeowners in wildfire hazard zones if high fire conditions occur, warn property owners in 100-year floodplain if heavy rainfall is expected, etc.).	General Fund, Grants	Public Works, City Manager, Fire	Low	TBD	Low (0)
P.7	Promote and assist business owners in Fullerton to develop and regularly update an emergency preparedness plan and expand the existing Alert OC system.	General Fund, Grants	Fire	Low	Ongoing	Low (0)
P.8	Organize frequent workshops on emergency preparedness topics (e.g., essential items for emergency kits, evacuation routes, landscaping to reduce runoff and fire risk) for residents and business owners.	General Fund, Grants	Fire	Low	Ongoing	Low (0)

¹ Some mitigation actions were subsequently added to this table after the HMPC had conducted the ranking and prioritization exercise. Such actions were not able to be voted upon the HMPC members and are thus denoted with the text “Not voted upon” in the “Priority” column.

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ¹
P.9	Conduct interjurisdictional trainings with partner first-responder agencies in the area, including CAL FIRE, OCFA, Orange County Sheriff's Department, CSUF University Police, police and fire departments of adjacent cities, and any other agencies that Fullerton may select in the future.	General Fund, Grants	Fire, Police	Low	Ongoing	Low (0)
P.10	Develop smart transportation demand management systems to respond to increased volumes of traffic during an evacuation.	General Fund, Grants	Public Works, Engineering	Medium	2021	Low (0)
P.11	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.	General Fund, Grants	Community Development, Public Works	Medium	2021	Low (0)
P.12	Develop partnership with wireless telephone companies to ensure that they maintain phone towers and communication facilities during emergency situations.	General Fund, Grants	City Manager, Fire	Low	TBD	Low (0)
P.13	Coordinate with major employment centers to ensure that adequate evacuation planning is conducted and infrastructure used for evacuation purposes (roads, bridges, sidewalks) are kept clear and in good repair to ensure accessibility for pedestrians and motorists.	General Fund, Grants	Community Development, Public Works	Medium	Ongoing	Not voted upon.
Multiple hazards²						
1.1	Install backup generators at key critical facilities (City Hall, Fire Stations, Police Stations, water pumps, etc.) in the event of power loss during an emergency. Install portable generators in City-owned water facilities. <i>(Hazards addressed: All)</i>	General Fund, Grants	Public Works	High	2021	High (5)
1.2	Frequently reassess the areas where critical facilities and areas of elevated hazard risk intersect. <i>(Hazards addressed: Dam failure, fire, flood, landslide, subsidence, hazardous materials release, seismic shaking, liquefaction, fault rupture).</i>	General Fund, Grants	All	Low	Ongoing	Low (0)
1.3	Encourage SoCalGas, Southern California Edison, Orange County Sanitation District, Metropolitan Water District of Orange County, and Orange County Water District to harden their infrastructure in the city to reduce the risk of breach. <i>(Hazards addressed: Dam failure, fire, flood, hazardous materials release, transportation accidents, terrorism)</i>	General Fund, Grants	City Manager and City Council	Low	Ongoing	Low (0)

² Some of the mitigation actions in the Multiple Hazards section address a combination of different hazards or they may address all of them. This is noted in the "Hazards Addressed" note after each mitigation action.

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ¹
1.4	Plant fire-resistant, drought-tolerant groundcover on slopes, inclines, and hillsides to reduce runoff and erosion during heavy rainfall. <i>(Hazards addressed: Drought, fire, flood, geologic)</i>	General Fund, Grants	Public Works, Community Development	Medium	Ongoing	Low (0)
1.5	Inform residents in areas of elevated hazard risk of the risks and proper preparation techniques and evacuation procedures. <i>(Hazards addressed: All)</i>	General Fund, Grants	City Manager, Administrative Services, Police, Fire	Medium	Ongoing	Low (0)
1.6	Position new critical facilities outside of elevated hazard risk areas and relocate existing critical facilities outside of hazard risk areas, as feasible. <i>(Hazards addressed: Dam failure, drought, fire, flood, geologic, and seismic)</i>	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)
1.7	Address structural or operational weaknesses in bridges, dams, retaining walls, etc. to reduce risk of failure during a hazard. <i>(Hazards addressed: All)</i>	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)
Dam Failure						
2.1	Coordinate with state and federal agencies to collectively identify threats to the City and the region and identify ways to retrofit/strengthen the dams under their control.	General Fund, Grants	Public Works, Parks and Recreation, City Manager	Low	Ongoing	Low (0)
2.2	Investigate the feasibility of an early warning alarm to be activated in the parts of Fullerton within a particular dam failure inundation area should the reservoir(s) breach.	General Fund, Grants	Public Works, City Manager	Medium	2020	Low (0)
Disease and pest management						
3.1	Coordinate with surrounding jurisdictions, local health care providers, businesses, schools, the Orange County Health Care Agency, the California Department of Public Health, and the Centers for Disease Control 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.	General Fund, Grants	City Manager, Fire	Low	Ongoing	Low (0)
3.2	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.	General Fund, Grants	City Manager	Low	Ongoing	Low (0)
3.3	Continue to work with residents, business owners, and utilities to remove dead, dying, and diseased trees weakened by disease/pests.	General Fund, Grants	Public Works, Community Development	Medium	Ongoing	Low (0)

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ¹
Drought						
4.1	Launch a pilot program with smart water meters to track water usage in commercial and industrial properties across the City.	General Fund, Grants	Public Works	High	2022	Medium (2)
4.2	Perform pilot study to predict water main breaks around Fullerton.	General Fund, Grants	Public Works	Medium	2022	Low (0)
4.3	Identify opportunities (grant funding, design assistance, etc.) to sponsor homeowner retrofits from lawns to low-water-consuming plants.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
Fire						
5.1	Remove highly flammable vegetation in Very High, High, and Moderate Fire Hazard Severity Zones and replant with fire-adapted specimens.	General Fund, Grants	Public Works	Medium	Ongoing	High (5)
5.2	Create a hillside weed abatement pilot program using goats or other livestock to reduce fuel loads in fire-prone areas.	General Fund, Grants	Fire	Medium	2021	High (4)
5.3	Obtain a Type 3 Fire Engine to respond to potential fire threats in the fire-prone areas of the City.	General Fund, Grants	Fire	High	2021	Medium (2)
5.4	Draft and adopt a Community Wildfire Preparedness Plan for areas within the Very High, High, and Moderate Fire Hazard Severity Zones.	General Fund, Grants	Fire	Medium	2023	Medium (1)
5.5	Create a rapid response plan from among Fullerton's and Orange County's first responders to secure hospital, nursing and assisted living facilities, as many of them are located within fire hazard severity zones.	General Fund, Grants	Fire	Low	2022	Medium (1)
5.6	Reinforce and regularly inspect fire retardant infrastructure such as sprinklers, fire hose terminals, and fire suppression systems in City facilities.	General Fund, Grants	Fire, Public Works	High	Ongoing	Low (0)
5.7	Clear dead vegetation in reservoir footprints, railroad rights-of-way, parks, and open spaces, especially during and after a drought episode.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
5.8	Develop a model to evaluate the water system to ensure it meets fire flow requirements throughout wildfire hazard zone areas.	General Fund, Grants	Public Works	Medium	2022	Low (0)

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority¹
5.9	Continue fire hazard prevention awareness campaign to residents in the High and Very High Fire Hazard Severity Zones.	General Fund, Grants	Fire	Medium	Ongoing	Low (0)
5.10	Expand the existing home preparedness assessment program to assist more residents in understanding and addressing their wildfire risk.	General Fund, Grants	Fire	Medium	2020	Low (0)
5.11	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.	General Fund, Grants	Community Development, Fire	Low	2025	Low (0)
Flood						
6.1	Draft an ecosystem restoration plan and upgrade of drainage systems in Gilman Park and other similar areas in Fullerton.	General Fund, Grants	Public Works	High	2022	Medium (3)
6.2	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.	General Fund, Grants	Public Works	High	2020	Medium (1)
6.3	Update the City's Drainage Area Master Plan on a regular basis to incorporate new data and/or address emerging issues.	General Fund, Grants	Public Works	High	Ongoing	Medium (1)
6.4	Keep all 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.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
6.5	Continually update the mapped boundaries of floodplain inundation zones within the City.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
6.6	Continuously pursue FEMA elevation certification for all structures in Fullerton.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)
6.7	Elevate and flood-proof public utility boxes above expected flood depth elevation in flood hazard inundation areas.	General Fund, Grants	Public Works	Medium	Ongoing	Low (0)

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ¹
6.8	Require new critical facilities to be built a minimum of 1 foot higher than the anticipated 500-year flood elevation height where feasible.	General Fund, Grants	All	High	2020	Low (0)
Geologic (Landslide, Subsidence)						
7.1	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.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Medium (2)
7.2	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.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Medium (1)
7.3	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.	General Fund, Grants	Public Works, Community Development	Low	Ongoing	Low (0)
Hazardous Materials Release						
8.1	Promote proper disposal of hazardous material items at regional collection centers operated by the County.	General Fund, Grants	City Manager	Low	Ongoing	Low (0)
8.2	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.	General Fund, Grants	Fire	Low	2024	Low (0)
Human-Caused (Aircraft Accident, Civil Disturbance, Cyber Threats, Terrorism, Transportation Accidents)						
9.1	Coordinate with the Orange County Intelligence Assessment Center (OCIAC) to monitor potential incidents resulting in civil disturbance events (riots, mass shootings, etc.).	General Fund, Grants	Police, Fire	Low	Ongoing	Medium (1)
9.2	Disseminate information on cyber threats or potential terrorist activity to City staff and continually follow up with information on further developments in the situation.	General Fund, Grants	City Manager	Low	Ongoing	Medium (1)
9.3	Regularly update cyber security software and educate business owners and residents on current internet-based threats.	General Fund, Grants	Information Technology, Administrative Services (Business Registration Division), City Manager	Medium	Ongoing	Low (0)

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority ¹
9.4	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.	General Fund, Grants	Public Works	High	2025	Low (0)
Seismic Hazards (Fault Rupture, Liquefaction, Seismic Shaking)						
10.1	Work with California Geologic Survey and the US Geologic Survey to identify and map the uncharted extents of fault lines within the City.	General Fund, Grants	Community Development	Low	Ongoing	Low (0)
10.2	Regularly update an inventory of buildings within the City that may be seismically vulnerable (adobe brick, unreinforced masonry, etc.)	General Fund, Grants	Community Development	Low	Ongoing	Low (0)
10.3	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.	General Fund, Grants	Community Development	Low	Ongoing	Low (0)
10.4	Incentivize individual property owners to upgrade and retrofit buildings or structures that are susceptible to damage or destruction during a seismic event.	General Fund, Grants	Community Development	Medium	Ongoing	Low (0)
10.5	Inspect all City-designated critical facilities, particularly City Hall and emergency response locations and complete any seismic retrofitting, as necessary.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)
10.6	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.	General Fund, Grants	Public Works, Community Development	High	2026	Not voted upon.
Severe Weather (Extreme Heat, Heavy Rain, Severe Wind)						
11.1	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, sick, lower-income, or persons with limited mobility to better ensure they have adequate time to prepare for a heatwave in advance.	General Fund, Grants	City Manager	Low	Ongoing	Low (0)

2019 LHMP MITIGATION ACTIONS

Mitigation Action		Potential Funding Sources	Responsible Agency/ Department	Relative Cost	Time Frame	Priority¹
11.2	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 potentially change as a result of climate change.	General Fund, Grants	Public Works, Parks and Recreation	Medium	2020	Low (0)
11.3	Trim trees that the City determines could blow over during a severe wind event. Move power lines underground when feasible.	General Fund, Grants	Public Works, Community Development	High	Ongoing	Low (0)

Relative Costs: Low (\$), \$0–\$25,000; Medium (\$\$), \$25,001–\$500,000; High (\$\$\$), >\$500,000.

Attachment No. 5

Policy Comparison

Existing Language



GOAL 7: Growth and development aligned with infrastructure capabilities.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P7.1 Balanced Decisionmaking
Support regional and subregional efforts to focus growth and development within areas that can be adequately served by existing and planned infrastructure systems.

City Level

P7.2 Housing Growth
Support projects, programs, policies and regulations to accommodate housing growth consistent with the Regional Housing Needs Assessment in areas of the City with existing and planned infrastructure capabilities. (See Chapter 2: Housing for related policies.)

Neighborhood/District Level

P7.3 Infrastructure Planning
Support projects, programs, policies and regulations to plan for appropriate levels and types of infrastructure based on the desired character of each neighborhood or district.

P7.4 Focus Area Planning
Support projects, programs, policies and regulations to evaluate infrastructure capabilities as part of community-based planning of Focus Areas.

Project Level

P7.5 Appropriate Development Scale
Support projects, programs, policies and regulations to ensure that development is appropriate in scale to current and planned infrastructure capabilities.

Also see:

Chapter 1: Community Development and Design

- P1.4 Connection and Integration of Uses
- P1.7 Development that Supports Mobility
- P1.19 Housing Choice

Chapter 4: Mobility

- P5.1 Circulation Between Cities
- P5.2 Reduction of Single Occupant Vehicle Trips
- P5.5 Fullerton Transportation Center
- P5.6 Quality Highways and Roads
- P5.7 Complete Streets
- P5.8 Maximization of Person-Trips
- P5.10 Easements and Rights-of-Way
- P5.12 Multi-Modal Traffic Analysis
- P5.13 Development Oriented Transit
- P5.14 Fair Share of Improvements
- P5.15 Neighborhood and Focus Area Connections

Chapter 5: Bicycle

- P6.7 Development Projects
- P6.8 Multi-Tiered Bicycle Network
- P6.11 Neighborhood and Focus Area Connections

Chapter 17: Air Quality and Climate Change

- P21.1 Jobs-Housing Balance

New Language (underlined)

GOAL 7:

Growth and development aligned with infrastructure capabilities.

Region/Subregion Level

P7.1 Balanced Decision Making

Require that all new development and major redevelopment have adequate infrastructure in place to support daily demands and emergency response capabilities.

A7.1(a)

Develop a program which evaluates the emergency infrastructure capabilities of potential development sites prior to issuance of construction permits.

City Level

P7.2 Housing Growth

Require that all new development and major redevelopment be located in areas previously identified as having adequate infrastructure capacity to accommodate future housing requirements. (See Chapter 2: Housing for related policies.)

P7.2.1 Adequate Infrastructure

Require that new development and major redevelopment are appropriate in scale to current and planned infrastructure capabilities, if not, require infrastructure upgrades are completed prior to issuance of certificate of occupancy.

Neighborhood/District Level

P7.3 Infrastructure Planning

Ensure infrastructure meets current and future daily demands and fire flow requirements while still meeting desired neighborhood/district character.

P7.4 Focus Area Planning

Support projects, programs, policies, and regulations to evaluate infrastructure capabilities as part of community-based planning of Focus Areas.

Project Level

P7.5 Appropriate Development Scale

Support projects, programs, policies, and regulations to ensure that development is appropriate in scale to current and planned infrastructure capabilities.

Existing Language



GOAL 12: Proactively addressing public safety concerns.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

- P12.1 Healthy Family Development**
Support programs that strengthen regional partnerships between public safety and human services agencies to encourage strong family relationships, reinforce healthy child development and encourage lawful behavior.
- P12.2 Collaboration with Outside Agencies**
Support regional and subregional efforts to prevent violence, child abuse, sexual assault, domestic violence, illegal use of firearms, violence associated with substance abuse, crimes against property and other similar issues.

City Level

- P12.3 Community Confidence Building**
Support policies and programs that bolster productive communication and problem-solving between public safety personnel and the Fullerton community.
- P12.4 Balance Safety Needs**
Support policies, projects, programs, and regulations that balance the need to reduce vehicle accidents, injuries, and deaths through traffic calming and street design with the need to facilitate emergency response times.

- P12.5 Community Preservation**
Support policies, programs and regulations pertaining to proactive code enforcement methods which reinforce the proper maintenance of properties, buildings and landscapes, and adherence to applicable regulations, while discouraging conditions that foster vandalism and more serious crime.
- P12.6 Youth Community Safety Partnership**
Support programs that involve young people in discussions about crime and prevention, increase youths' attachment to the community, engage youth in productive activities, and reinforce success in education.
- P12.7 Fire Code Amendments**
Support policies, programs and regulations that give the Fire Marshall flexibility to approve streets and fire lanes with reduced clearance requirements when other fire safety factors are incorporated into the project (such as street connectivity, traffic safety and the presence of sprinkler systems).
- P12.7.1 THIRA***
Support projects, programs, policies and regulations that facilitate the preparation of a THIRA (Threat and Hazard Identification Risk Assessment) plan in accordance with FEMA guidelines that allows Fullerton to plan for and address the risks of human-caused hazards.

New Language (underlined)

GOAL 12:

Proactively addressing public safety concerns.

Region/Subregion Level

P12.1 Healthy Family Development
Support programs that strengthen regional partnerships between public safety and human services agencies to encourage strong family relationships, reinforce healthy child development and encourage lawful behavior.

P12.1.1 Encourage Regional Cooperation
Encourage regional partnerships and mutual aid agreements between the City and other agencies/entities, further strengthening emergency response capabilities within the City and region.

P12.2 Collaboration with Outside Agencies
Support regional and subregional efforts to prevent violence, child abuse, sexual assault, domestic violence, illegal use of firearms, violence associated with substance abuse, crimes against property and other similar issues.

P12.2.1 Fire Risk Reduction Coordination
Coordinate with local and regional agencies (Fullerton Fire Department, Orange County Fire Authority, Cal Trans, etc.) and require vegetation management and long-term maintenance of fire hazard reduction projects (including community fire breaks) on all private and public roads and properties in the WUI and in fire hazard severity zones.

City Level

P12.3 Community Confidence Building
Support policies and programs that bolster productive communication and problem solving between public safety personnel and the Fullerton community.

P12.3.1 Natural Hazards Education
Establish a public outreach education program (with special attention to at risk populations) which educates residents and businesses about the natural hazards in Fullerton.

P12.3.2 Fire Risk Reduction Education
Educate residents (with special attention to at risk populations) and businesses on the City's vegetation management practices, including fire safety, landscape installation and maintenance, defensible space, and other fire hazard reduction strategies.

P12.3.3 Evacuation Outreach/Education
Conduct public outreach and educational activities associated with emergency evacuation routes and procedures, prioritizing efforts towards at-risk populations.

P12.3.4 Emergency Planning Outreach
Publicize and participate in disaster preparedness exercises and distribute emergency planning information to residents and business owners.

P12.4 Balance Safety Needs
Support policies, projects, programs, and regulations that balance the need to reduce vehicle accidents, injuries, and deaths through traffic calming and street design with the need to facilitate emergency response times.

P12.4.1 Street Name Regulations
Ensure street naming and numbering systems adequately identify properties in compliance with Fire Safe Regulations, adopted California Fire Code (CFC), and local ordinances, to avoid potential confusion for emergency response vehicles.

P12.4.2 Fire Regulations
Regularly re-evaluate specific fire hazard areas and adopt reasonable safety standards covering such elements as vegetation management around homes, adequacy of existing and future water supplies, fire flow tests, fire hydrants, routes or thoroughways for fire equipment access, clarity of addresses and street signs, and long-term maintenance in compliance with Fire Safe Regulations, adopted CFC, and local ordinances.

Existing Language



New Language (underlined)

GOAL 12: Proactively addressing public safety concerns.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Neighborhood/District Level

- P12.8 Airport Safety Standards**
Support policies, projects, programs and regulations that provide for safe and efficient airport operations through compliance with the Fullerton Municipal Airport (FMA) Master Plan and the Airport Land Use Commission for Orange County's Airport Environs Land Use Plan for FMA and the Airport Environs Land Use Plan for Heliports.
- P12.9 Neighborhood Safety Strategy**
Support policies, projects, programs and regulations that strengthen partnerships and community-based efforts, such as Neighborhood Watch, to reduce crime through prevention, education and enforcement, and encourage communities to build block-by-block networks to prevent crime, develop social ties and solve common problems.
- P12.10 Community Involvement in Crime Prevention**
Support policies and programs that involve the community in supporting informal monitoring, participating in legitimate activities and building a sense of ownership and control over neighborhoods.
- P12.11 Public Safety in Focus Areas**
Support projects, programs, policies and regulations to proactively address public safety concerns as part of community-based planning of Focus Areas.

- P12.12 Crime Prevention**
Support policies, programs and regulations that implement crime prevention strategies that have demonstrated success, including Crime Prevention Through Environmental Design (CPTED), Crime-Free Multi-Housing, Business Watch; Neighborhood Watch, iWatch and other similar strategies.

Project Level

- P12.13 Safety through Design**
Support policies, projects, programs and regulations that make crime prevention and the maintenance of public safety service levels considerations in design and management of existing and new private and public spaces.

Also see Chapter 9: Revitalization, P11.4 Neighborhood Safety.

P12.4.3 Fire Hazard Reduction
Require all developments located in the WUI and VHFHSZ to meet or exceed statewide Fire Safe Regulations (title 14, CCR, division 1.5, chapter 7, subchapter 2, articles 1-5 (commencing with section 1270) (SRA Fire Safe Regulations) and title 14, CCR, division 1.5, chapter 7, subchapter 3, article 3 (commencing with section 1299.01) (Fire Hazard Reduction Around Buildings and Structures Regulations)).

A 12.4.3 (a)
If proposed, ensure any fire breaks and other fire defense improvements on public and private property are adequately funded and maintained in perpetuity in compliance with California Fire Code and local adopted ordinances.

P12.4.4 Fire Regulation Coordination
Coordinate with the Fullerton Fire Department and Orange County Fire Authority on the need for additional fire prevention regulations for the built out, populated areas of the City.

A12.4.4(a)
Design and ensure all private roads are maintained to permit unrestricted emergency equipment and personnel access in compliance with the California Fire Code, and local ordinances.

P12.5 Community Preservation
Support policies, programs and regulations pertaining to proactive code enforcement methods which reinforce the proper maintenance of properties, buildings and landscapes, and adherence to applicable regulations, while discouraging conditions that foster vandalism and more serious crime.

P12.6 Youth Community Safety Partnership
Support programs that involve young people in discussions about crime and prevention, increase youths' attachment to the community, engage youth in productive activities, and reinforce success in education.

P12.7 Fire Code Amendments
Support policies, programs and regulations that give the Fire Marshall flexibility to approve streets and fire lanes with reduced clearance requirements when other fire safety factors are incorporated into the project (such as street

connectivity, traffic safety and the presence of sprinkler systems).

P12.7.1 THIRA*
Support projects, programs, policies and regulations that facilitate the preparation of a THIRA (Threat and Hazard Identification Risk Assessment) plan in accordance with FEMA guidelines that allows Fullerton to plan for and address the risks of human-caused hazards.

P12.7.2 Periodic Updates
Periodically update and incorporate the THIRA into the Local Hazard Mitigation Plan (LHMP) and Emergency Operations Plan (EOP) updates.

P12.7.3 Code Compliance
Require new developments and major remodels or renovations to comply with the California Building Code, California Fire Code, and local adopted ordinances for construction and adequacy of water flow and pressure, ingress/egress, and other measures to ensure adequate fire protection.

Neighborhood/District Level

P12.8 Airport Safety Standards
Support policies, projects, programs and regulations that provide for safe and efficient airport operations through compliance with the Fullerton Municipal Airport (FMA) Master Plan and the Airport Land Use Commission for Orange County's Airport Environs Land Use Plan for FMA and the Airport Environs Land Use Plan for Heliports.

P12.9 Neighborhood Safety Strategy
Support policies, projects, programs and regulations that strengthen partnerships and community-based efforts, such as Neighborhood Watch, to reduce crime through prevention, education and enforcement, and encourage communities to build block-by-block networks to prevent crime, develop social ties and solve common problems.

Existing Language

New Language (underlined)

P12.10 Community Involvement in Crime Prevention

Support policies and programs that involve the community in supporting informal monitoring, participating in legitimate activities and building a sense of ownership and control over neighborhoods.

P12.11 Public Safety in Focus Areas

Support projects, programs, policies and regulations to proactively address public safety concerns as part of community-based planning of Focus Areas.

P12.11.1 Accessible Outreach Materials

Ensure that all emergency preparedness and public safety educational materials are made available in all relevant languages for the residents of Fullerton, including English, Spanish, Tagalog, Korean, and Chinese.

P12.12 Crime Prevention

Support policies, programs and regulations that implement crime prevention strategies that have demonstrated success, including Crime Prevention Through Environmental Design (CPTED), Crime-Free Multi-Housing, Business Watch; Neighborhood Watch, iWatch and other similar strategies.

P12.12.1 Emergency Response Capability

Maintain a high level of emergency response capability.

A12.12.1(a)

Ensure annual budgeting cycles account for current and future emergency service needs.

A12.12.1(b)

Periodically assess and update the City's priorities for future emergency service needs.

P12.12.2 Maintenance and Training

Support enhancements to fire service through the maintenance of fire equipment and the training of fire personnel.

P12.12.3 Emergency Management Planning

Coordinate the City's emergency management planning with local jurisdictions and regional agencies to anticipate cumulative impacts during times of disaster.

Project Level

P12.13 Safety through Design

Support policies, projects, programs and regulations that make crime prevention and the maintenance of public safety service levels considerations in design and management of existing and new private and public spaces.

P12.14 Fire Protection Plans

Require fire protection plans (consistent with requirements of the California Fire Code, including a risk analysis, fire response capabilities, fire safety requirements (defensible space, infrastructure, and building ignition resistance), mitigation measures and design considerations for non-conforming fuel modifications, wildfire education maintenance and limitations, and evacuation plans for new development and major remodels in Very High Fire Hazard Severity Zones (VHFHSZ) and Wildland-Urban Interface (WUI) areas designated by the City and CAL FIRE.

A12.14 (a)

Ensure fire protection plans developed during the development review process address issues associated with restricted and single points of access, parking restrictions, and investigating the feasibility of establishing special assessment districts to improve road capacity and adequate water supply.

Existing Language



GOAL 13: Responsive to public safety needs.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P13.1 Inter-City Coordination

Support regional and subregional efforts to: coordinate as appropriate Continuity of Operations Plan, plans and procedures for Emergency Operations Centers, and emergency response training systems; maintain inter-agency and public communications systems that will provide mutual aid and be reliable during and following an emergency; and, formulate definitive plans and procedures for evacuation of hazard-prone areas and high risk uses.

P13.4 Disaster Risk Reduction

Support programs that promote greater public awareness of disaster risks, personal and business risk reduction, and personal and neighborhood emergency response.

P13.5 Community Emergency Preparedness

Support policies, programs and regulations that ensure the City, its residents, businesses and services are prepared for effective response and recovery in the event of emergencies or disasters, including the provision of information about the current nature and extent of local safety hazards and emergency plans, including evacuation plans and procedures to accommodate special needs populations. Information should be provided in multiple languages to maximize understanding by community members.

P13.6 Inter-Department Coordination

Support policies and programs that improve the coordination of disaster-related programs within City departments.

City Level

P13.2 Adequate Resources for Emergencies

Support policies and programs that ensure adequate resources are available in all areas of the City to respond to health, fire and police emergencies.

P13.3 Disaster Hazard Reduction

Support policies, projects, programs and regulations that reduce structural and non-structural hazards to life safety and minimize property damage and resulting social, cultural and economic dislocations resulting from future disasters.

New Language (underlined)

GOAL 13:

Responsive to public safety needs.

Region/Subregion Level

P13.1 Inter-City Coordination

Support regional and subregional efforts to: coordinate as appropriate Continuity of Operations Plan, plans and procedures for Emergency Operations Centers, and emergency response training systems; maintain inter-agency and public communications systems that will provide mutual aid and be reliable during and following an emergency; and, formulate definitive plans and procedures for evacuation of hazard-prone areas and high risk uses.

City Level

P13.2 Adequate Resources for Emergencies

Support policies and programs that ensure adequate resources are available in all areas of the City to respond to health, fire and police emergencies.

A13.2 (a)

Ensure emergency personnel are included in the development review process to ensure that new development adequately addresses service levels, security concerns, and safety.

P13.3 Disaster Hazard Reduction

Support policies, projects, programs and regulations that reduce structural and nonstructural hazards to life safety and minimize property damage and resulting social, cultural and economic dislocations resulting from future disasters.

P13.4 Disaster Risk Reduction

Support programs that promote greater public awareness of disaster risks, personal and business risk reduction, and personal and neighborhood emergency response.

P13.4.1 Post-Disaster Recovery

Expand and enhance the strategy for post-disaster recovery that focuses on community resilience, sustainability, and an evaluation for redevelopment potential following a major disaster.

P13.5 Community Emergency Preparedness

Support policies, programs and regulations that ensure the City, its residents, businesses and services are prepared for effective response and recovery in the event of emergencies or disasters, including the provision of information about the current nature and extent of local safety hazards and emergency plans, including evacuation plans and procedures to accommodate special needs populations. Information should be provided in multiple languages to maximize understanding by community members.

P13.5.1 Effective Evacuation

Require new development, redevelopments, and major remodels ensure effective future evacuations during emergencies by supporting feasible enhancements to the City's evacuation network and facilities.

P13.5.2 Minimum Emergency Access Points

Require all new developments and redevelopments within fire hazard severity zones, and the WUJ, provide a minimum of two points of access by means of public roads that can be used for emergency vehicle response and evacuation purposes, where practicable.

P13.5.3 Functionality in Hazardous Events

Maintain functionality, make improvements, and expand the capacity, where feasible, of the existing emergency evacuation routes within the City, taking into account current and future natural and human caused hazards.

P13.5.4 Community Outreach for Evacuation

Conduct public outreach and educational activities associated with emergency evacuation routes and procedures, prioritizing efforts towards at-risk populations.

P13.5.5 Maintain Adequate Access

Ensure existing development in areas with sufficient water supply infrastructure and roadway capacity to maintain adequate evacuation and emergency equipment access do not degrade as a result of new development.

A13.5.5(a)

Identify the feasibility of constructing additional emergency access improvements for existing developments that do not meet minimum road standards for emergency equipment, such as:

Existing Language



GOAL 13: Responsive to public safety needs.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

P13.7 New Technologies for Fire and Police Services

Support policies, programs and regulations which are based on research and evaluation and that implement new technologies and methods to improve the efficiency and effectiveness of fire and police services.

P13.8 Staff Training on Structural Risks

Support programs for ongoing staff training focused on the risks posed by older structures and infrastructure, as well as how to reduce those risks.

P13.9 Nuisance Enforcement

Support policies, programs and regulations that maintain or strengthen code enforcement as an important tool to uphold community health, safety and welfare consistent with the provisions of the Fullerton Municipal Code.

P13.10 Community Education on Emergency Preparedness

Support policies and programs to involve and educate the Fullerton community in emergency preparedness.

Neighborhood/District Level

P13.11 Crime Reduction Strategies

Support policies, programs and regulations to create problem-solving strategies and plans for areas with higher crime rates in the City and to reduce crime by implementing these strategies and plans through a range of measures including increased policing activities, neighborhood partnerships and other innovative programs.

See Chapter 20: Natural Hazards for related policies and actions.

New Language (underlined)

- Additional vehicle pullouts at key hillside locations.
- Limiting or restricting on-street parking at key hillside locations.
- Potential for construction of new or improved emergency access routes.
- Roadside clearance improvements.

P13.5.6 Enhancing Evacuation

Require new development, redevelopment, and major remodels ensure effective future evacuations during emergencies by supporting feasible enhancements to the City's evacuation network and facilities.

P13.5.7 Emergency Evacuation Capacity

Maintain functionality, make improvements, and expand the capacity, where feasible, of the existing emergency evacuation routes within the City, taking into account current and future natural and human caused hazards.

P13.6 Inter-Department Coordination

Support policies and programs that improve the coordination of disaster-related programs within City departments.

P13.6.1 Mutual Aid Agreements

Expand or enhance mutual aid agreements to further enhance City capabilities during an emergency incident.

P13.7 New Technologies for Fire and Police Services

Support policies, programs and regulations which are based on research and evaluation and that implement new technologies and methods to improve the efficiency and effectiveness of fire and police services.

P13.8 Staff Training on Structural Risks

Support programs for ongoing staff training focused on the risks posed by older structures and infrastructure, as well as how to reduce those risks.

P13.8.1 Seismic Structures Compliance

Comply with State statutes and requirements regarding the identification and retrofit of seismically vulnerable structures.

P13.8.2 Retrofit Guidelines

Develop retrofit guidelines for existing non-conforming properties to understand what improvements may be necessary to comply with the California Fire Code, local ordinances, and best management practices.

A13.8.2 (a)

Create an inventory of all structures in the City that do not meet current seismic and fire safety standards.

A13.8.2 (b)

Create a retrofit incentive program to assist property owners in bringing these buildings into compliance.

P13.9 Nuisance Enforcement

Support policies, programs and regulations that maintain or strengthen code enforcement as an important tool to uphold community health, safety and welfare consistent with the provisions of the Fullerton Municipal Code.

P13.10 Community Education on Emergency Preparedness

Support policies and programs to involve and educate the Fullerton community in emergency preparedness.

P13.11 Essential Facilities Location

Ensure new public/critical facilities (schools, hospitals, fire stations, etc.) are not located in Fire Hazard Severity Zones to the greatest extent feasible. If located in these areas, ensure full compliance with California Fire Code and local ordinance and adequate fire response and evacuation capabilities are available.

Existing Language



GOAL 18: Citizens that are actively involved in shaping the community's future and overall quality of life.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P18.1 Regional Participation

Support programs that encourage local participation in regional planning, decision-making and activities that affect the City of Fullerton and its residents.

P18.2 Multi-Jurisdiction Outreach Tools

Support regional and subregional efforts to develop new outreach tools, such as a clearinghouse feature on cities' websites for use by other public entities and regional agencies (such as school districts, universities, neighborhood organizations, transportation agencies, etc.) to post notices of items under their jurisdiction.

City Level

P18.3 Opportunities for Community Involvement

Support policies, projects, programs and regulations that maximize opportunities for public participation in planning and decision-making processes pertaining to community development and design, including outreach to members of underrepresented communities.

P18.4 Volunteerism and Civic Activities

Support policies and programs that support opportunities for volunteerism and engagement of community members in civic activities.

P18.5 Transparent Government

Support policies, programs and regulations that maintain transparency in municipal operations and decision-making by being clear about City objectives and providing access to information, City staff and decision makers.

P18.6 Accessible Participation

Support policies, projects, programs and regulations that take all feasible steps to ensure that everyone interested in participating in community forums has the materials necessary to contribute to informed decisions.

P18.7 Diverse Representation

Support policies and programs that facilitate full representation of Fullerton's diverse community on City committees and commissions.

P18.8 Low- or No-Cost Meeting Facilities

Support policies and programs that provide and promote opportunities for low- or no-cost meeting rooms in City facilities for community groups and local organizations as incentives for strengthening community engagement.

New Language (underlined)

GOAL 18:

Citizens that are actively involved in shaping the community's future and overall quality of life.

P18.1 Regional Participation

Support programs that encourage local participation in regional planning, decision-making and activities that affect the City of Fullerton and its residents.

P18.2 Multi-Jurisdiction Outreach Tools

Support regional and subregional efforts to develop new outreach tools, such as a clearinghouse feature on cities' websites for use by other public entities and regional agencies (such as school districts, universities, neighborhood organizations, transportation agencies, etc.) to post notices of items under their jurisdiction.

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Support policies and programs that facilitate full representation of Fullerton's diverse community on City committees and commissions.

P18.8 Low- or No-Cost Meeting Facilities

Support policies and programs that provide and promote opportunities for low- or no-cost meeting rooms in City facilities for community groups and local organizations as incentives for strengthening community engagement.

P18.9 Youth Engagement

Support policies and programs that engage youth in City governance through opportunities such as internships and having youth representatives on public bodies.

P18.10 Noticing

Support policies and programs to review and update the City's noticing requirements and consider the use of websites, automatic telephone calling systems, email distribution lists, text messaging and other innovative features to provide better access to information.

P18.11 Media

Support policies standardizing the issuance of press releases for major planning efforts and development projects in order to provide information to the Fullerton community and to encourage community involvement at workshops and hearings.

P18.11.1 Fire Hazard Avoidance

Support fire prevention, public education, early detection programs, and property inspections to identify and avoid fire hazards.

A18.11.1(a)

Educate residents (with special attention to at risk populations) and businesses on the City's vegetation management practices, including fire safety, landscaping installation and maintenance, defensible space, and other fire hazard reduction strategies.

Existing Language

New Language (underlined)

GOAL 18: Citizens that are actively involved in shaping the community's future and overall quality of life.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

P18.9 Youth Engagement

Support policies and programs that engage youth in City governance through opportunities such as internships and having youth representatives on public bodies.

P18.10 Noticing

Support policies and programs to review and update the City's noticing requirements and consider the use of websites, automatic telephone calling systems, email distribution lists, text messaging and other innovative features to provide better access to information.

P18.11 Media

Support policies standardizing the issuance of press releases for major planning efforts and development projects in order to provide information to the Fullerton community and to encourage community involvement at workshops and hearings.

Neighborhood/District Level

P18.12 Neighborhood Organizations and HOAs

Support policies and programs that encourage neighborhood involvement by engaging neighborhood organizations and homeowner associations (HOAs) in projects affecting their particular area.

P18.13 Self Reliance

Support policies programs and regulations that strengthen the efforts of neighborhoods and districts to become self-reliant when it comes to solving area problems.

P18.14 Convenient Meetings

Support policies, projects, programs, and regulations that uphold the scheduling of community meetings at locations and times convenient for community members desiring to provide input.

Project Level

P18.15 Early Notification Opportunities

Support policies, programs and regulations that maximize opportunities for early notification of proposed projects, or projects/issues under consideration, using the most current technologies as they become available.

Neighborhood/District Level

P18.12 Neighborhood Organizations and HOAs

Support policies and programs that encourage neighborhood involvement by engaging neighborhood organizations and homeowner associations (HOAs) in projects affecting their particular area.

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Support policies programs and regulations that strengthen the efforts of neighborhoods and districts to become self-reliant when it comes to solving area problems.

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Support policies, projects, programs, and regulations that uphold the scheduling of community meetings at locations and times convenient for community members desiring to provide input.

Project Level

P18.15 Early Notification Opportunities

Support policies, programs and regulations that maximize opportunities for early notification of proposed projects, or projects/issues under consideration, using the most current technologies as they become available.

Existing Language



GOAL 19: An adequate, safe, and reliable water supply.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P19.1 Agency Coordination for Water Supplies
Support regional and subregional efforts to ensure that an adequate water supply, including groundwater, remains available.

P19.2 Conservation Efforts
Support regional and subregional efforts to promote water efficiency and conservation.

P19.3 New Technologies
Support projects, programs, policies and regulations to encourage the use of new technologies which reduce water use.

P19.3.1 Regional Water Protection*
Support regional and subregional efforts to safeguard water infrastructure and supply against the treats of contamination or disruption from disaster events of a regional or national scale, such as terrorism, earthquakes, floods, geologic activity, or other events as they arise.

P19.3.2 Climate Resilience in Water Supply*
Support regional and subregional efforts to adapt current water supply practices in anticipation of reduced water availability due to the effects of climate change.

City Level

P19.4 Adequate Supply
Support projects, programs, policies and regulations to maintain adequate quantities of water, including groundwater, available to the City now and in the future.

P19.5 Water Quality
Support projects, programs, policies and regulations to ensure the quality of the water supply.

P19.5.1 Water-saving Infrastructure*
Support projects, programs, policies, and regulations that will lead to the capture, storage, and re-use of rainwater in the city so as to reduce Fullerton's dependence on external sources of water.

Neighborhood/District Level

P19.6 Focus Area Planning
Support projects, programs, policies and regulations to evaluate ways to conserve and reduce water use as part of community-based planning of Focus Areas.

Project Level

P19.7 Sustainable Water Practices in New Development
Support projects, programs, policies and regulations to encourage water efficient practices in site and building design for private and public projects.

New Language (underlined)

GOAL 19:

An adequate, safe, and reliable water supply.

Region/Subregion Level

P19.1 Agency Coordination for Water Supplies
Support regional and subregional efforts to ensure that an adequate water supply, including groundwater, remains available.

P19.1.1 Adequate Infrastructure and Capacity
Ensure existing development in areas with sufficient water supply infrastructure and roadway capacity maintain adequate evacuation and emergency equipment access so as not to degrade as a result of new development.

P19.2 Conservation Efforts
Support regional and subregional efforts to promote water efficiency and conservation.

P19.3 New Technologies
Support projects, programs, policies and regulations to encourage the use of new technologies which reduce water use.

P19.3.1 Regional Water Protection*
Support regional and subregional efforts to safeguard water infrastructure and supply against the treats of contamination or disruption from disaster events of a regional or national scale, such as terrorism, earthquakes, floods, geologic activity, or other events as they arise.

P19.3.2 Climate Resilience in Water Supply*
Support regional and subregional efforts to adapt current water supply practices in anticipation of reduced water availability due to the effects of climate change.

City Level

P19.4 Adequate Supply
Support projects, programs, policies and regulations to maintain adequate quantities of water, including groundwater, available to the City now and in the future.

P19.4.1 Water Provider Coordination
Coordinate with water providers to maintain and enhance water supply infrastructure to ensure adequate supplies for existing and future daily demands and firefighting suppression requirements.

P19.5 Water Quality
Support projects, programs, policies and regulations to ensure the quality of the water supply.

P19.5.1 Water-saving Infrastructure*
Support projects, programs, policies, and regulations that will lead to the capture, storage, and re-use of rainwater in the city so as to reduce Fullerton's dependence on external sources of water.

Neighborhood/District Level

P19.6 Focus Area Planning
Support projects, programs, policies and regulations to evaluate ways to conserve and reduce water use as part of community-based planning of Focus Areas.

Project Level

P19.7 Sustainable Water Practices in New Development
Support projects, programs, policies and regulations to encourage water efficient practices in site and building design for private and public projects.

Existing Language



GOAL 20: A healthy watershed and clean urban runoff.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

- P20.1 Regional Watersheds**
Support regional and subregional efforts to support functional and healthy watersheds.
- P20.2 Urban Runoff Management**
Support regional and subregional efforts to support cleaner and reduced urban runoff.

City Level

- P20.3 Product Handling and Disposal Impacts**
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff from the improper handling and disposal of commercial products.

P20.3.1 Natural Water System Integrity*
Support projects, programs, policies and regulations that encourage the re-emergence of natural watersheds throughout the city's extent.

Neighborhood/District Level

- P20.4 Local Watersheds**
Support projects, programs, policies and regulations that support a functional and healthy watershed within neighborhoods and districts.

- P20.5 Water Quality of Focus Areas**
Support projects, programs, policies and regulations to encourage site and infrastructure improvements within the City's Focus Areas to support cleaner and reduced urban runoff.

Project Level

- P20.6 Construction Impacts**
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by private and public construction projects.
- P20.7 Development Impacts**
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by the design or operation of a site or use.
- P20.7.1 Incorporate Natural Water Systems in Design Standards***
Support projects, programs, policies and regulations that encourage the preservation of natural creeks and waterways into new projects and developments in Fullerton.

New Language (underlined)

GOAL 20:

A healthy watershed and clean urban runoff.

Region/Subregion Level

P20.1 Regional Watersheds
Support regional and subregional efforts to support functional and healthy watersheds.

P20.2 Urban Runoff Management
Support regional and subregional efforts to support cleaner and reduced urban runoff.

City Level

P20.3 Product Handling and Disposal Impacts
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff from the improper handling and disposal of commercial products.

P20.3.1 Natural Water System Integrity*
Support projects, programs, policies and regulations that encourage the re-emergence of natural watersheds throughout the city's extent.

Neighborhood/District Level

P20.4 Local Watersheds
Support projects, programs, policies and regulations that support a functional and healthy watershed within neighborhoods and districts.

P20.5 Water Quality of Focus Areas
Support projects, programs, policies and regulations to encourage site and infrastructure improvements within the City's Focus Areas to support cleaner and reduced urban runoff.

Project Level

P20.6 Construction Impacts
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by private and public construction projects.

P20.7 Development Impacts
Support projects, programs, policies and regulations to reduce impacts to watersheds and urban runoff caused by the design or operation of a site or use.

P20.7.1 Incorporate Natural Water Systems in Design Standards*
Support projects, programs, policies and regulations that encourage the preservation of natural creeks and waterways into new projects and developments in Fullerton.

P20.7.2 Impact of New Development
To the greatest extent feasible, require that all new development and major redevelopment activities, do not impact natural drainage or increase stormflows off the proposed project site.

Existing Language



GOAL 24: Responsible management of open spaces balanced with the healthy functioning of environmental systems.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

- P24.1 Management and Maintenance**
Support projects, programs and policies to coordinate with existing regional park districts, the private sector and nonprofit institutions to manage and maintain regional open spaces.
- P24.2 Land Trusts**
Support projects, programs and policies to encourage the establishment of land trusts to help preserve significant open space within the region.

City Level

- P24.3 Access and Use of Open Space**
Support projects, programs, policies and regulations to increase access to and use of open space resources while respecting the natural environment.

- P24.4 Accessibility for All**
Support projects, programs, policies and regulations to ensure that, when natural topography allows, public open spaces are accessible to people of all abilities.
- P24.5 Long-Range Needs**
Support projects, programs, policies and regulations to preserve areas of open space sufficient to meet the long-range needs of the City.
- P24.6 Watershed Management**
Support projects, programs, policies and regulations to manage open space watersheds to limit potential fire and erosion hazards.
- P24.7 New Open Space**
Support projects, programs, policies and regulations to create open space as funding and other opportunities become available.

New Language (underlined)

GOAL 24:

Responsible management of open spaces balanced with the healthy functioning of environmental systems.

Region/Subregion Level

- P24.1 Management and Maintenance**
Support projects, programs and policies to coordinate with existing regional park districts, the private sector and nonprofit institutions to manage and maintain regional open spaces.
- P24.2 Land Trusts**
Support projects, programs and policies to encourage the establishment of land trusts to help preserve significant open space within the region.

City Level

- P24.3 Access and Use of Open Space**
Support projects, programs, policies and regulations to increase access to and use of open space resources while respecting the natural environment.

P24.4 Accessibility for All
Support projects, programs, policies and regulations to ensure that, when natural topography allows, public open spaces are accessible to people of all abilities.

P24.5 Long-Range Needs
Support projects, programs, policies and regulations to preserve areas of open space sufficient to meet the long-range needs of the City.

P24.6 Watershed Management
Support projects, programs, policies and regulations to manage open space watersheds to limit potential fire, food, and erosion hazards.

P24.7 New Open Space
Support projects, programs, policies and regulations to create open space as funding and other opportunities become available.

P24.8 Open Space Maintenance
Ensure open space brush areas, susceptible to wildfire risk, are adequately maintained in accordance with the California Fire Code and local adopted ordinances.

Existing Language



GOAL 26: Protection of people, natural and built environments and economy from natural hazards.

Policies

Specific statements that provide a directive or framework for City decision-making that directly contribute to the attainment of the goal.

Region/Subregion Level

P26.1 Regional Coordination
Support projects, programs, policies and regulations to coordinate planning for and response to natural disasters with other agencies within the region.

City Level

P26.2 Adequate Emergency Response Infrastructure
Support projects, programs, policies and regulations to prepare to respond to natural disasters to the best of the City's ability.

P26.2.1 Continual Efforts*

Support projects, programs, policies and regulations to continually update and refine the City's Safety Element, Local Hazard Mitigation Plan, Emergency Operations Plan, and other plans as staff may deem relevant with the latest available information on hazards and disaster risk in Fullerton.

Neighborhood/District Level

P26.3 Focus Area Planning
Support projects, programs, policies and regulations to consider natural hazard risks and mitigation as part of community-based planning of Focus Areas.

P26.3.1 Community Hazard Mapping*

Support projects, programs, policies and regulations that help communities and residents of neighborhood blocks understand what kinds of hazards could occur in their area and which areas are the most susceptible to fire, geologic, seismic, and flooding hazards.

Project Level

P26.4 Minimization of Development in High Risk Areas
Support projects, programs, policies and regulations to discourage or limit development within areas that are vulnerable to natural disasters, particularly in areas with recurring damage and/or the presence of multiple natural hazards.

P26.5 Hazard Specific Development Regulations
Support projects, programs, policies and regulations to utilize hazard specific development regulations to mitigate risks associated with identified potential natural hazards, including flooding, wildland fires, liquefaction, and landslides when development does occur.

Also see Chapter 10: Public Safety for related policies.

New Language (underlined)

GOAL 26:

Protection of people, natural and built environments and economy from natural hazards.

Region/Subregion Level

P26.1 Regional Coordination

Support projects, programs, policies and regulations to coordinate planning for and response to natural disasters with other agencies within the region.

P26.1.1 Mutual Aid

Encourage regional partnerships and mutual aid agreements between the City and other agencies/entities, further strengthening emergency response capabilities within the City and region.

City Level

P26.2 Adequate Emergency Response Infrastructure

Support projects, programs, policies and regulations to prepare to respond to natural disasters to the best of the City's ability.

P26.2.1 Continual Efforts*

Support projects, programs, policies and regulations to continually update and refine the City's Safety Element, Local Hazard Mitigation Plan, Emergency Operations Plan, and other plans as staff may deem relevant with the latest available information on hazards and disaster risk in Fullerton.

P26.2.2 Reduce Development Risk

Encourage new development outside of the very high fire hazard severity zone. If development is proposed in the very high fire hazard severity zone, require fire safe design (including but not limited to; defensible space and home hardening) and compliance with fire safe regulations, adopted CFC, and local ordinances.

Neighborhood/District Level

P26.3 Focus Area Planning

Support projects, programs, policies and regulations to consider natural hazard risks and mitigation as part of community-based planning of Focus Areas.

P26.3.1 Community Hazard Mapping*

Support projects, programs, policies and regulations that help communities and residents of neighborhood blocks understand what kinds of hazards could occur in their area and which areas are the most susceptible to fire, geologic, seismic, and flooding hazards

P26.3.2 Public Availability of Mapping

Update mapping for natural hazards as new data becomes available. Ensure that the most current version of the mapping is made available in public outreach materials.

Project Level

P26.4 Minimization of Development in High Risk Areas

Support projects, programs, policies and regulations to discourage or limit development within areas that are vulnerable to natural disasters, particularly in areas with recurring damage and/or the presence of multiple natural hazards.

P26.5 Hazard Specific Development Regulations

Support projects, programs, policies and regulations to utilize hazard specific development regulations to mitigate risks associated with identified potential natural hazards, including flooding, wildland fires, liquefaction, and landslides when development does occur.

P26.6 Enhance Fire Protection

Require new development to incorporate design measures that enhance fire protection in areas of elevated fire risk (including the WUI and Fire Hazard Severity Zones). This shall include but is not limited to the incorporation of fire-resistant structural design, use of fire-resistant landscaping, home hardening, defensible space and vegetation management around the perimeter of structures.

GOAL 26 (a):

A community prepared for future climate related impacts.

P26.7 Collaborate on Resilience

Collaborate with local, regional, state, and/or federal jurisdictions and agencies on climate resiliency and adaptation strategies in the City.

Existing Language

New Language (underlined)

P26.8 Monitor Changes

Monitor climate change-related effects with local, regional, state, and/or federal partners to provide information about the effectiveness of existing infrastructure and programs within the City.

P26.9 Monitor Indicators

Coordinate with regional, state, and federal agencies to monitor the indicators and impacts of climate change as they relate to the City.

P26.10 Update City Plans

Monitor and periodically update the Fullerton Climate Action Plan, The Fullerton Green Project, Sustainable Fullerton, and the Fullerton Local Hazard Mitigation Plan as required to include the most up to date climate adaptation mapping and information.

Attachment No. 6

Board of Forestry and Fire Protection Safety Element Review

General Plan Safety Element Assessment

Board of Forestry and Fire Protection



Fullerton 2024

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Purpose and Background

Upon the next revision of the housing element on or after January 1, 2014, the safety element is required to be reviewed and updated as necessary to address the risk of fire for land classified as state responsibility areas and land classified as very high fire hazard severity zones. (Gov. Code, § 65302, subd. (g)(3).)

The safety element is required to include:

- Fire hazard severity zone maps available from the Department of Forestry and Fire Protection.
- Any historical data on wildfires available from local agencies or a reference to where the data can be found.
- Information about wildfire hazard areas that may be available from the United States Geological Survey.
- The general location and distribution of existing and planned uses of land in very high fire hazard severity zones (VHFHSZs) and in state responsibility areas (SRAs), including structures, roads, utilities, and essential public facilities. The location and distribution of planned uses of land shall not require defensible space compliance measures required by state law or local ordinance to occur on publicly owned lands or open space designations of homeowner associations.
- The local, state, and federal agencies with responsibility for fire protection, including special districts and local offices of emergency services. (Gov. Code, § 65302, subd. (g)(3)(A).)

Based on that information, the safety element shall include goals, policies, and objectives that protect the community from the unreasonable risk of wildfire. (Gov. Code, § 65302, subd. (g)(3)(B).) To carry out those goals, policies, and objectives, feasible implementation measures shall be included in the safety element, which include but are not limited to:

- Avoiding or minimizing the wildfire hazards associated with new uses of land.
- Locating, when feasible, new essential public facilities outside of high fire risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in the SRA or VHFHSZ.
- Designing adequate infrastructure if a new development is located in the SRA or VHFHSZ, including safe access for emergency response vehicles, visible street signs, and water supplies for structural fire suppression.
- Working cooperatively with public agencies with responsibility for fire protection. (Gov. Code, § 65302, subd. (g)(3)(C).)

The safety element shall also attach or reference any fire safety plans or other documents adopted by the city or county that fulfill the goals and objectives or contains the information required above. (Gov. Code, § 65302, subd. (g)(3)(D).) This might include Local Hazard Mitigation Plans, Unit Fire Plans, Community Wildfire Protection Plans, or other plans.

There are several reference documents developed by state agencies to assist local jurisdictions in updating their safety elements to include wildfire safety. The Fire Hazard Planning, General Plan Technical Advice Series from the Governor's Office of Planning and Research (OPR), referenced in Government Code section 65302, subdivision (g)(3) and available at
1400 Tenth Street
Sacramento, CA 95814
Phone: (916) 322-2318

The Technical Advice Series is also available from the OPR website ([Technical Advice Series link](#))*.

The Technical Advice Series provides policy guidance, information resources, and fire hazard planning examples from around California that shall be considered by local jurisdictions when reviewing the safety element of its general plan.

The Board of Forestry and Fire Protection (Board) utilizes this Safety Element Assessment in the Board's review of safety elements under Government Code section 65302.5. At least 90 days prior to the adoption or amendment of their safety element, counties that contain SRAs and cities or counties that contain VHFHSZs shall submit their safety element to the Board. (Gov. Code, § 65302.5, subd. (b).) The Board shall review the safety element and respond to the city or county with its findings regarding the uses of land and policies in SRAs or VHFHSZs that will protect life, property, and natural resources from

unreasonable risks associated with wildfires, and the methods and strategies for wildfire risk reduction and prevention within SRAs or VHFHSZs. (Gov. Code, § 65302.5, subd. (b)(3).)

The CAL FIRE Land Use Planning team provides expert fire protection assistance to local jurisdictions statewide. Fire captains are available to work with cities and counties to revise their safety elements and enhance their strategic fire protection planning.

Methodology for Review and Recommendations

Utilizing staff from the CAL FIRE Land Use Planning team, the Board has established a standardized method to review the safety element of general plans. The methodology includes

- 1) reviewing the safety element for the requirements in Government Code section 65302, subdivision (g)(3)(A),
- 2) examining the safety element for goals, policies, objectives, and implementation measures that mitigate the wildfire risk in the planning area (Gov. Code, § 65302, subd. (g)(3)(B) & (C)), and
- 3) making recommendations for methods and strategies that would reduce the risk of wildfires (Gov. Code, § 65302.5, subd. (b)(3)(B)).

The safety element will be evaluated against the attached Assessment, which contains questions to determine if a safety element meets the fire safety planning requirements outlined in Government Code, section 65302. The reviewer will answer whether or not a submitted safety element addresses the required information, and will recommend changes to the safety element that will reduce the wildfire risk in the planning area. These recommended changes may come from the list of sample goals, policies, objectives, and implementation measures that is included in this document after the Assessment, or may be based on the reviewer's knowledge of the jurisdiction in question and their specific wildfire risk. By answering the questions in the Assessment, the reviewer will determine if the jurisdiction's safety element has adequately addressed and mitigated their wildfire risk. If it hasn't, any specific recommendations from the reviewer will assist the jurisdiction in revising the safety element so that it does.

Once completed, the Assessment should provide clear guidance to a city or county regarding any areas of deficiency in the safety element as well as specific goals, policies, objectives, and implementation measures the Board recommends adopting in order to mitigate or reduce the wildfire threat in the planning area.

General Plan Safety Element Assessment

Jurisdiction: City of Fullerton	Notes: FORMAL Review	CAL FIRE Unit:CSR	Date Received: 07/09/2024
County: Orange	LUPP Reviewer: Jose Quintana	UNIT CONTACT: Joe Kennedy	Date Reviewed: 07/09/2024

BACKGROUND INFORMATION SUMMARY

The safety element must contain specific background information about fire hazards in each jurisdiction.

Instructions for this table: Indicate whether the safety element includes the specified information. If YES, indicate in the comments where that information can be found; if NO, provide recommendations to the jurisdiction regarding how best to include that information in their revised safety element.

Required Information	Yes or No	Comments and Recommendations
Are Fire Hazard Severity Zones Identified? <i>CAL FIRE or Locally Adopted Maps</i>	Yes	Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement) – Exhibit 5 (pg. 11)
Is historical data on wildfires or a reference to where the data can be found, and information about wildfire hazard areas that may be available from the United States Geological Survey, included?	Yes	Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement) – (pg. 10) and Exhibit 6 (pg. 12)
Has the general location and distribution of existing and planned uses of land in very high fire hazard severity zones (VHFHSZs) and in state responsibility areas (SRAs), including structures, roads, utilities, and essential public facilities, been identified?	Yes	Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement) – text (pg. 10) and Exhibit 5 (pg. 11) 2020 Fullerton LHMP (pgs. 4-14 through 4-19).
Have local, state, and federal agencies with responsibility for fire protection, including special districts and local offices of emergency services, been identified?	Yes	Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement) – (pg. 1 and pg. 10). 2020 Fullerton LHMP – pg. 3-21 “Location and Extent” 1 st paragraph 2020 Fullerton LHMP – pg. 5-4, Table 5-1 Capabilities assessment, Fire Department, Orange County Fire Authority
Are other fire protection plans, such as Community Wildfire Protection Plans, Local Hazard Mitigation Plans, CAL FIRE Unit or Contract County Fire Plans, referenced or incorporated into the Safety Element?	Yes	Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement) – (pgs. 1-2). Fullerton SE Update (Revised Goals) , P12.7.2 [pg. 3]; P26.2.1 [pg. 12]; Fullerton Plan pg. 105, P22.8.1 - Adopt Neighborhood Plans: * Support projects, programs, policies and regulations to prepare local communities in Fullerton to prepare for the increased risks associated with climate change, such as Community Wildfire Preparedness

Required Information	Yes or No	Comments and Recommendations
		Plans and evacuation plans in case of flood inundation or dam failure.
Are residential developments in fire hazard areas that do not have at least two emergency evacuation routes identified?	Yes	<p>Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement) – (pgs. 2-3), Exhibit 2 (pg. 5).</p> <p>Fullerton SE Update (Revised Goals) P13.5.1 Effective Evacuation (pg. 5) P 13.5.2 Minimum Emergency Access Points (pg. 5) P 13.5.3 Functionality in Hazardous Events (pg. 5) P13.5.5 Maintain Adequate Access (pg. 5) P13.5.6 Enhancing Evacuation (pg.6) P13.5.7 Emergency Evacuation Capacity (pg.6) P 19.1.1 Adequate Infrastructure and Capacity (pg. 9)</p>
Have evacuation routes and their capacity, safety, and viability under a range of emergency scenarios been identified?	Yes	<p>Fullerton SE Update (Revised Goals) P13.5.1 Effective Evacuation (pg. 5) P 13.5.2 Minimum Emergency Access Points (pg. 5) P 13.5.3 Functionality in Hazardous Events (pg. 5) P13.5.5 Maintain Adequate Access (pg. 5) P13.5.6 Enhancing Evacuation (pg.6) P13.5.7 Emergency Evacuation Capacity (pg.6)</p>

Is there any other information in the Safety Element regarding fire hazards in SRAs or VHFHSZs?
<p>“N/A”</p> <p>If there is additional relevant info in the SE not captured in the assessment - “Yes” AND cite what it is and where to find it (Policy/program/figure/section title, p.#)</p>

GOALS, POLICIES, OBJECTIVES, AND FEASIBLE IMPLEMENTATION MEASURES

The safety element must contain a set of goals, policies, and objectives based on the above information to protect the community from unreasonable risk of wildfire and implementation measures to accomplish those stated goals, policies, and objectives.

Instructions for this table: Critically examine the submitted safety element and determine if it is adequate to address the jurisdiction’s unique fire hazard. Answer YES or NO appropriately for each question below. If the recommendation is irrelevant or unrelated to the jurisdiction’s fire hazard, answer N/A. For NO, provide information in the Comments/Recommendations section to help the jurisdiction incorporate that change into their safety element revision. This information may utilize example recommendations from Sample Safety Element Recommendations and Fire Hazard Planning in Other Elements of the General Plan below, may indicate how high of a priority this recommendation is for a jurisdiction, or may include other jurisdiction-specific information or recommendations.

Section 1 Avoiding or minimizing the wildfire hazards associated with new uses of land

Questions	Yes or No	Comments and Recommendations
Does local ordinance require development standards that meet or exceed title 14, CCR, division 1.5, chapter 7, subchapter 2, articles 1-5 (commencing with section 1270) (<u>SRA Fire Safe Regulations</u>) and title 14, CCR, division 1.5, chapter 7, subchapter 3, article 3 (commencing with section 1299.01) (<u>Fire Hazard Reduction Around Buildings and Structures Regulations</u>) for SRAs and/or VHFHSZs?	Yes	<p>Fullerton Plan (pg. 243) Table 13 Short Term Action Plan, Action 26.4 “For projects within Wildfire Areas (see exhibit 17), require landscape and building plans to incorporate defensible space between natural vegetation and buildings, on site fire detection, and automatic sprinkler systems, non-combustible roofing materials (tile or concrete) and other appropriate mitigation measures.”</p> <p>Fullerton SE Update (Revised Goals) P12.2.1 Fire Risk Reduction Coordination (pg. 2) P 12.4.1 Street Name Regulations (pg. 2) P 12.4.2 Fire Regulations (pg. 2) P12.4.3 Fire Hazard Reduction (pg. 3)</p>
Are there goals and policies to avoid or minimize new residential development in VHFHSZs?	Yes	<p>Fullerton Plan pg. 112 P26.4 - Minimization of Development in High-Risk Areas P26.5 - Hazard Specific Development Regulations Fullerton SE Update (Revised Goals) P12.4.4 Fire Regulation Coordination (pg. 3) P26.2.2 Reduce Development Risk (pg. 12)</p>
Has fire safe design been incorporated into future development requirements?	Yes	<p>Fullerton SE Update (Revised Goals) P 18.15.1 Fire Hazard Avoidance (pg. 7) P 26.5 Hazard Specific Development Regulations (pg. 12) P26.6 Enhance Fire Protection (pg. 12)</p>
Are new essential public facilities located outside high fire risk areas, such as VHFHSZs, when feasible?	Yes	<p>Fullerton SE Update (Revised Goals) P13.11 Essential Facilities Location (pg. 6)</p>
Are there plans or actions identified to mitigate existing non-conforming development to contemporary fire safe standards, in terms of road standards and vegetative hazard?	Yes	<p>Fullerton SE Update (Revised Goals) P12.4.2 Fire Regulations (pg. 2) P 13.5.5 Maintain Adequate Access (pg. 5) A13.5.5(a) (pg.5-6) P 13.8.2 Retrofit Guidelines (pg. 6) P 13.8.2 (a) P 13.8.2 (b)</p>
Does the plan include policies to evaluate re-development after a large fire?	Yes	<p>Fullerton SE Update (Revised Goals) P 13.3 Disaster Hazard Reduction (pg. 5) P 13.4.1 Post-Disaster Recovery (pg. 5)</p>

Questions	Yes or No	Comments and Recommendations
Is fuel modification around homes and subdivisions required for new development in SRAs or VHFHSZs?	Yes	Fullerton SE Update (Revised Goals) P12.2.1 Fire Risk Reduction Coordination (pg. 2) P12.4.2 Fire Regulations (pg. 2) P12.14 Fire Protection Plans (pg. 4) P26.6 Enhance Fire Protection (pg. 12)
Are fire protection plans required for new development in VHFHSZs?	Yes	Fullerton SE Update (Revised Goals) P12.14 Fire Protection Plans (pg. 4)
Does the plan address long term maintenance of fire hazard reduction projects, including community fire breaks and private road and public road clearance?	Yes	Fullerton SE Update (Revised Goals) P12.2.1 Fire Risk Reduction Coordination (pg. 2) P12.4.2 Fire Regulations (pg. 2)
Is there adequate access (ingress, egress) to new development in VHFHSZs?	Yes	Fullerton SE Update (Revised Goals) P13.5.1 Effective Evacuation (pg. 5) P13.5.2 Minimum Emergency Access Points (pg. 5) P 13.5.6 Enhancing Evacuation (pg. 6)
Are minimum standards for evacuation of residential areas in VHFHSZs defined?	Yes	Fullerton SE Update (Revised Goals) P13.5.5 Maintain Adequate Access (pg. 5)
If areas exist with inadequate access/evacuation routes, are they identified? Are mitigation measures or improvement plans identified?	Yes	Fullerton SE Update (Revised Goals) A 13.5.5(a) (pgs. 5-6) P13.5.7 Emergency Evacuation Capacity (pg. 6)
Are there policies or programs promoting public outreach about defensible space or evacuation routes? Are there specific plans to reach at-risk populations?	Yes	Fullerton Plan P13.4, Disaster Risk Reduction (pg. 74) P13.5, Community Emergency Preparedness (pg. 74) P13.10, Community Education on Emergency Preparedness (pg. 75) P18.3 Opportunities for Community Involvement (pg. 94) Fullerton SE Update (Revised Goals) P 12.3.1 Natural Hazards Education (pg. 2) P12.3.2 Fire Risk Reduction Education (pg. 2) P18.11.1 Fire Hazard Avoidance (pg. 7) A18.11.1(a) (pg. 7)
Does the plan identify future water supply for fire suppression needs?	Yes	Fullerton SE Update (Revised Goals) P12.4.2 Fire Regulations (pg. 2) P19.4.1 Water Provider Coordination (pg. 9)
Does new development have adequate fire protection?	Yes	Fullerton Plan P13.2, Adequate Resources for Emergencies (pg. 74) Fullerton SE Update (Revised Goals) P12.7.3 Code Compliance (pg. 3) A13.2(a) (pg. 5) P26.2 Adequate Emergency Response Infrastructure (pg. 12)

Questions	Yes or No	Comments and Recommendations
		P26.6 Enhance Fire Protection (pg. 12)

Section 2 Develop adequate infrastructure if a new development is located in SRAs or VHFHSZs.

Does the plan identify adequate infrastructure for new development related to:	Yes or No	Comments and Recommendations
Water supply and fire flow?	Yes	Fullerton SE Update (Revised Goals) P 19.1.1 Adequate Infrastructure and Capacity (pg. 9) P19.4 Adequate Supply (pg. 9) P 19.4.1 Water Provider Coordination (pg. 9)
Location of anticipated water supply?	Yes	Fullerton SE Update (Revised Goals) P 19.1.1 Adequate Infrastructure and Capacity (pg. 9) P19.4 Adequate Supply (pg. 9) P 19.4.1 Water Provider Coordination (pg. 9) P19.7 Sustainable Water Practices in New Development
Maintenance and long-term integrity of water supplies?	Yes	Fullerton SE Update (Revised Goals) P19.1 Agency Coordination for Water Supplies P 19.1.1 Adequate Infrastructure and Capacity (pg. 9) P19.4 Adequate Supply (pg. 9) P 19.4.1 Water Provider Coordination (pg. 9) P19.7 Sustainable Water Practices in New Development
Evacuation and emergency vehicle access?	Yes	Fullerton SE Update (Revised Goals) P13.5.1 Effective Evacuation (pg. 5) P13.5.2 Minimum Emergency Access Points (pg. 5) P13.5.5 Maintain Adequate Access (pg. 5) <i>A13.5.5(a) (pg. 5)</i> <i>P13.5.6 Enhancing Evacuation (pg. 6)</i> <i>P13.5.7 Emergency Evacuation Capacity (pg.7)</i>
Fuel modification and defensible space?	Yes	Fullerton SE Update (Revised Goals) P12.2.1 Fire Risk Reduction Coordination (pg. 2) P12.3.2 Fire Risk Reduction Education (pg. 2) P12.4.2 Fire Regulations (pg. 2) <i>A12.4.3(a) (pg. 3)</i> P 26.2.2 Reduce Development Risk (pg. 12) Fullerton Plan

Does the plan identify adequate infrastructure for new development related to:	Yes or No	Comments and Recommendations
		P24.11.1 Manage Wildfire Areas (pg. 111)
Vegetation clearance maintenance on public and private roads?	Yes	Fullerton Plan P24.11.1 Manage Wildfire Areas (pg. 111) Fullerton SE Update (Revised Goals) P12.2.1 Fire Risk Reduction Coordination (pg. 2) A12.4.3(a) (pg 3) A12.4.4(a) (pg. 3)
Visible home and street addressing and signage?	Yes	Fullerton SE Update (Revised Goals) P12.4.1 Street Name Regulations (pg. 2) P12.4.2 Fire Regulations (pg. 2)
Community fire breaks? Is there a discussion of how those fire breaks will be maintained?	Yes	Fullerton SE Update (Revised Goals) P12.2.1 Fire Risk Reduction Coordination A12.4.3(a) (pg. 3)

Section 3 Working cooperatively with public agencies responsible for fire protection.

Question	Yes or No	Comments and Recommendations
Is there a map or description of existing emergency service facilities and areas lacking service, specifically noting any areas in SRAs or VHFHSZs?	Yes	Fullerton Plan SE, pg. 175, Exhibit 15: Police and Fire Protection Facilities
Does the plan include an assessment and projection of future emergency service needs?	Yes	Fullerton SE Update (Revised Goals) P7.1 Balance Decision Making (pg. 1) P7.2 Housing Growth (pg. 1) P12.1.1 Encourage Regional Cooperation (pg. 2) A12.12.1(a) (pg. 4) A12.12.1(b) (pg. 4) P13.2 Adequate Resources for Emergencies (pg. 5) P13.7 New Technologies for Fire and Police Services (pg. 6)
Are goals or standards for emergency services training described?	Yes	Fullerton SE Update (Revised Goals) P12.12.2 Maintenance and Training (pg. 4) P13.1 Inter-City Coordination (pg. 5) P13.8 Staff Training on Structural Risks (pg. 6)
Does the plan outline inter-agency preparedness coordination and mutual aid multi-agency agreements?	Yes	Fullerton SE Update (Revised Goals) P13.1 Inter-City Coordination (pg. 5) P13.6 Inter-Department Coordination (pg. 6) P13.6.1 Mutual Aid Agreements (pg. 6)

Compendium of Documents

2020 Local Hazard Mitigation Plan

Fullerton Plan (General Plan) Updated in 2020 [some of the policies identified in this plan may also be located on the Fullerton SE Update (Revised Goals) document].

Fullerton SE Update (Revised Goals)

Fullerton SE Update (Appendix X – Fullerton Safety Element Supplement)

Sample Safety Element Recommendations

These are examples of specific policies, objectives, or implementation measures that may be used to meet the intent of Government Code sections 65302, subdivision (g)(3) and 65302.5, subdivision (b). Safety element reviewers may make recommendations that are not included here.

A. MAPS, PLANS AND HISTORICAL INFORMATION

1. Include or reference CAL FIRE Fire Hazard Severity Zone maps or locally adopted wildfire hazard zones.
2. Include or reference the location of historical information on wildfires in the planning area.
3. Include a map or description of the location of existing and planned land uses in SRAs and VHFHSZs, particularly habitable structures, roads, utilities, and essential public facilities.
4. Identify or reference a fire plan that is relevant to the geographic scope of the general plan, including the Unit/Contract County Fire Plan, Local Hazard Mitigation Plan, and any applicable Community Wildfire Protection Plans.
5. Align the goals, policies, objectives, and implementation measures for fire hazard mitigation in the safety element with those in existing fire plans, or make plans to update fire plans to match the safety element.
6. Create a fire plan for the planning area.

B. LAND USE

1. Develop fire safe development codes to use as standards for fire protection for new development in SRAs or VHFHSZs that meet or exceed the statewide minimums in the SRA Fire Safe Regulations.
2. Adopt and have certified by the Board of Forestry and Fire Protection local ordinances which meet or exceed the minimum statewide standards in the SRA Fire Safe Regulations.
3. Identify existing development that do not meet or exceed the SRA Fire Safe Regulations or certified local ordinances.
4. Develop mitigation measures for existing development that does not meet or exceed the SRA Fire Safe Regulations or certified local ordinances or identify a policy to do so.

C. FUEL MODIFICATION

1. Develop a policy to communicate vegetation clearance requirements to seasonal, absent, or vacation rental owners.
2. Identify a policy for the ongoing maintenance of vegetation clearance on public and private roads.
3. Include fuel breaks in the layout/siting of subdivisions.
4. Identify a policy for the ongoing maintenance of existing or proposed fuel breaks.
5. Identify and/or map existing development that does not conform to current state and/or locally adopted fire safety standards for access, water supply and fire flow, signing, and vegetation clearance in SRAs or VHFHSZs.
6. Identify plans and actions for existing non-conforming development to be improved or mitigated to meet current state and/or locally adopted fire safety standards for access, water supply and fire flow, signing, and vegetation clearance.

D. ACCESS

1. Develop a policy that approval of parcel maps and tentative maps in SRAs or VHFHSZs is conditional based on meeting the SRA Fire Safe Regulations and the Fire Hazard Reduction Around Buildings and Structures Regulations, particularly those regarding road standards for ingress, egress, and fire equipment access. (See Gov. Code, § 66474.02.)
2. Develop a policy that development will be prioritized in areas with an adequate road network and associated infrastructure.
3. Identify multi-family housing, group homes, or other community housing in SRAs or VHFHSZs and develop a policy to create evacuation or shelter in place plans.
4. Include a policy to develop pre-plans for fire risk areas that address civilian evacuation and to effectively communicate those plans.
5. Identify road networks in SRAs or VHFHSZs that do not meet title 14, CCR, division 1.5, chapter 7, subchapter 2, articles 2 and 3 (commencing with section 1273.00) or certified local ordinance and develop a policy to examine possible mitigations.

E. FIRE PROTECTION

1. Develop a policy that development will be prioritized in areas with adequate water supply infrastructure.
2. Plan for the ongoing maintenance and long-term integrity of planned and existing water supply infrastructure.
3. Map existing emergency service facilities and note any areas lacking service, especially in SRAs or VHFHSZs.
4. Project future emergency service needs for the planned land uses.
5. Include information about emergency service trainings or standards and plans to meet or maintain them.
6. Include information about inter-agency preparedness coordination or mutual aid agreements.

Fire Hazard Planning in Other Elements of the General Plan

When updating the General Plan, here are some ways to incorporate fire hazard planning into other elements. Wildfire safety is best accomplished by holistic, strategic fire planning that takes advantage of opportunities to align priorities and implementation measures within and across plans.

LAND USE ELEMENT

Goals and policies include mitigation of fire hazard for future development or limit development in very high fire hazard severity zones.

Disclose wildland urban-interface hazards, including fire hazard severity zones, and/or other vulnerable areas as determined by CAL FIRE or local fire agency.

Design and locate new development to provide adequate infrastructure for the safe ingress of emergency response vehicles and simultaneously allow citizen egress during emergencies.

Describe or map any Firewise Communities or other fire safe communities as determined by the National Fire Protection Association, Fire Safe Council, or other organization.

HOUSING ELEMENT

Incorporation of current fire safe building codes.

Identify and mitigate substandard fire safe housing and neighborhoods relative to fire hazard severity zones.

Consider diverse occupancies and their effects on wildfire protection (group housing, seasonal populations, transit-dependent, etc).

OPEN SPACE AND CONSERVATION ELEMENTS

Identify critical natural resource values relative to fire hazard severity zones.

Include resource management activities to enhance protection of open space and natural resource values.

Integrate open space into fire safety planning and effectiveness.

Mitigation for unique pest, disease and other forest health issues leading to hazardous situations.

CIRCULATION ELEMENT

Provide adequate access to very high fire hazard severity zones.

Develop standards for evacuation of residential areas in very high fire hazard severity zones.

Incorporate a policy that provides for a fuel reduction maintenance program along roadways.

Attachment No. 7

PowerPoint Presentation

Planning Commission Meeting

Safety Element Update

March 12, 2025

Safety Element History

- 1 May 2012- Fullerton Plan was adopted (including the Safety Element).
- 2 May 2020- City adopted the latest Local Hazard Mitigation Plan
- 3 Since the original update, California Government Code Section 65302 (g) has been updated **five** times adding new requirements to Safety Elements.
- 4 2024 City initiated an update to the Safety Element

What is a Safety Element?

- **Mandatory** chapter of the General Plan
- Addresses the **safety needs of the community**
- **Required Components**
 - ✓ Background and Technical Information
 - ✓ Maps of hazards
 - ✓ Goals and policies
 - ✓ Safety Element Implementation actions and programs
- Safety Element Update **requires** frequent update to meet legislative mandate



* Required if Disadvantaged Communities are located in the Jurisdiction

** Required in certain locations within California

Safety Element Requirements

Govt Code 65302(g)(1) - Protection of the Community From Unreasonable Risks Associated With:

Seismically
induced
surface rupture

Ground
Shaking

Flooding

Tsunami,
Seiche, and
Dam Failure

Subsidence

Liquefaction

Ground Failure

Wildland and
Urban Fires

Slope
Instability
(Mudslides and
Landslides)

Military
Installations

Peakload Water
Supply
Requirements

Min. Road Widths
& Clearances
Around
Structures

Evacuation
Routes

Safety Element Requirements

65302(g)(2) - 2009

On the next revision of the Housing Element:

- The Safety Element shall be revised to address potential flood hazard issues, mapping, and policies.

65302(g)(3) - 2014

On the next revision of the Housing Element:

- Address wildfire hazard issues if the jurisdiction includes Very High Fire Hazard Severity Zones or State Responsibility Areas. (SB 1241)

65302(g)(4) - 2017

On the next revision of the Local Hazard Mitigation Plan:

- The Safety Element shall be reviewed and updated as necessary to address climate adaptation and resiliency through the preparation of a vulnerability assessment or reliance on a Local Hazard Mitigation Plan that addresses climate adaptation risks and vulnerabilities. (SB 379)

65302(g)(5) - 2020

On the next revision of the Housing Element on or after January 1, 2020:

- The safety element shall be reviewed and updated as necessary to identify residential developments in any hazard area identified in the safety element that do not have at least two emergency evacuation routes. (SB 99)

65302(g)(6) - 2018

On the next revision of the Housing Element or LHMP:

- The Safety Element shall be updated at least every eight years to address the items identified in GC 65302 (g) 1,2,3,4, and 5. (SB 1035)

65302(g)(7)

Cities/Counties with a flood plain management ordinance approved by FEMA:

- May use the information in the safety element to comply with this subdivision.

65302(g)(8)

Prior to periodic General Plan review or revisions to the Safety Element:

- Consultation with the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board (if located within the boundaries of the Sacramento and San Joaquin Drainage District), and California Office of Emergency Services.

65302(g)(9)

Sufficiently detailed County Safety Element:

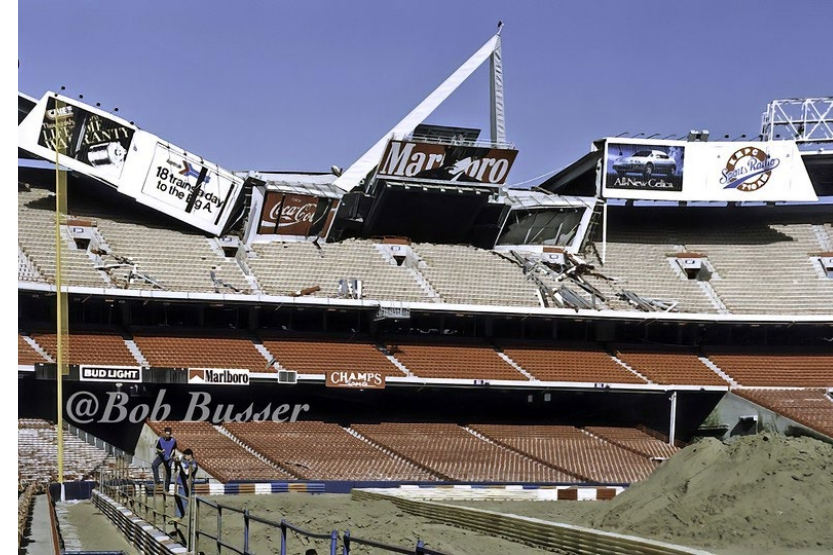
- Allows a City within the County to adopt the County Safety Element as its own if it contains appropriate policies and programs for adoption by a city.

What is in a Safety Element?

Govt Code 65302 (g) (1) - Protection of the Community From Unreasonable Risks Associated With:

Geologic/Seismic Hazards

- ✓ Seismically Induced Surface Rupture
- ✓ Ground Shaking
- ✓ Liquefaction
- ✓ Ground Failure
- ✓ Subsidence



What is in a Safety Element?

Govt Code 65302 (g) (1) - Protection of the Community From Unreasonable Risks Associated With:

Flooding
Dam Inundation
Sea Level Rise
Tsunami/Seiche
Slope Instability

- ✓ Mudslides
- ✓ Landslides



What is in a Safety Element?

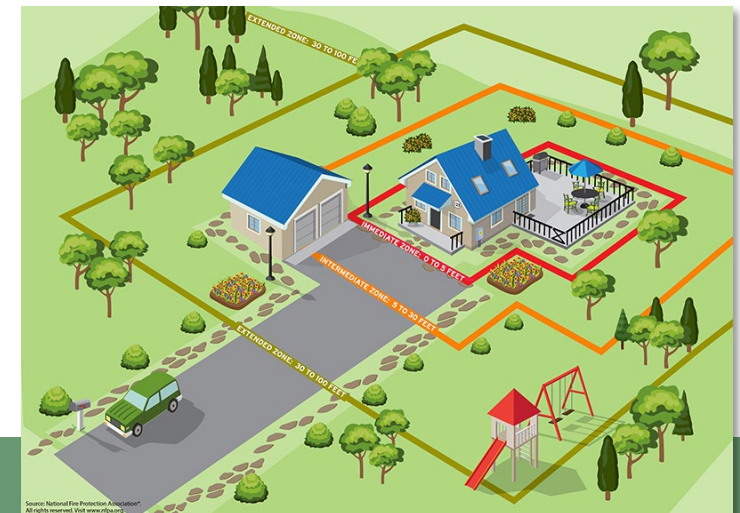
Govt Code 65302 (g) (1) - Protection of the Community From Unreasonable Risks Associated With:

Wildland and Urban Fires

- ✓ Evacuation Routes
- ✓ Peak load Water Supply Requirements
- ✓ Minimum Road Widths
- ✓ Clearances Around Structures



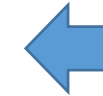
Source: Time



Why Update the Safety Element?

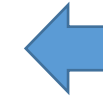
New State Requirements for Safety Elements

SB 1035



Integrates the Housing and Safety Elements

AB 2140



Provides financial benefits to jurisdictions that have integrated the LHMP into the Safety Element

SB 1241

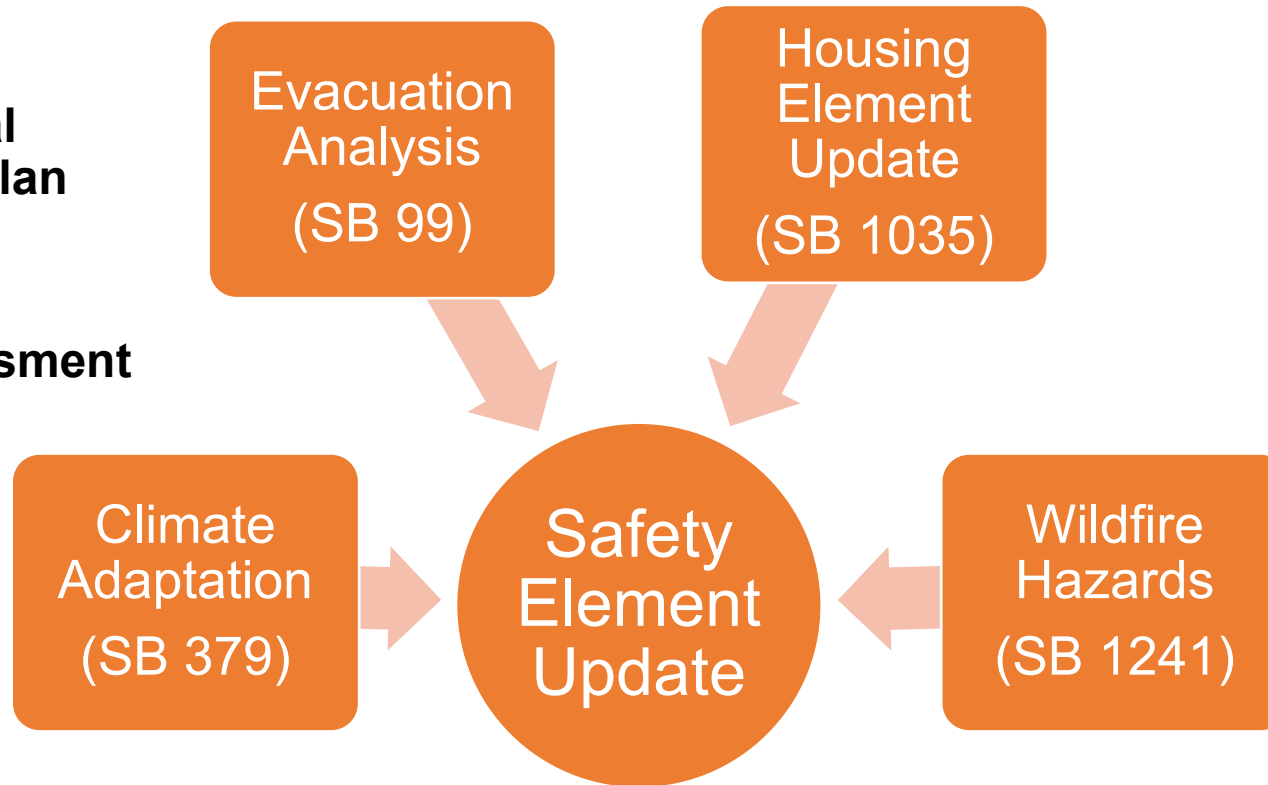


Compliance includes oversight by Cal Fire

Relying on:

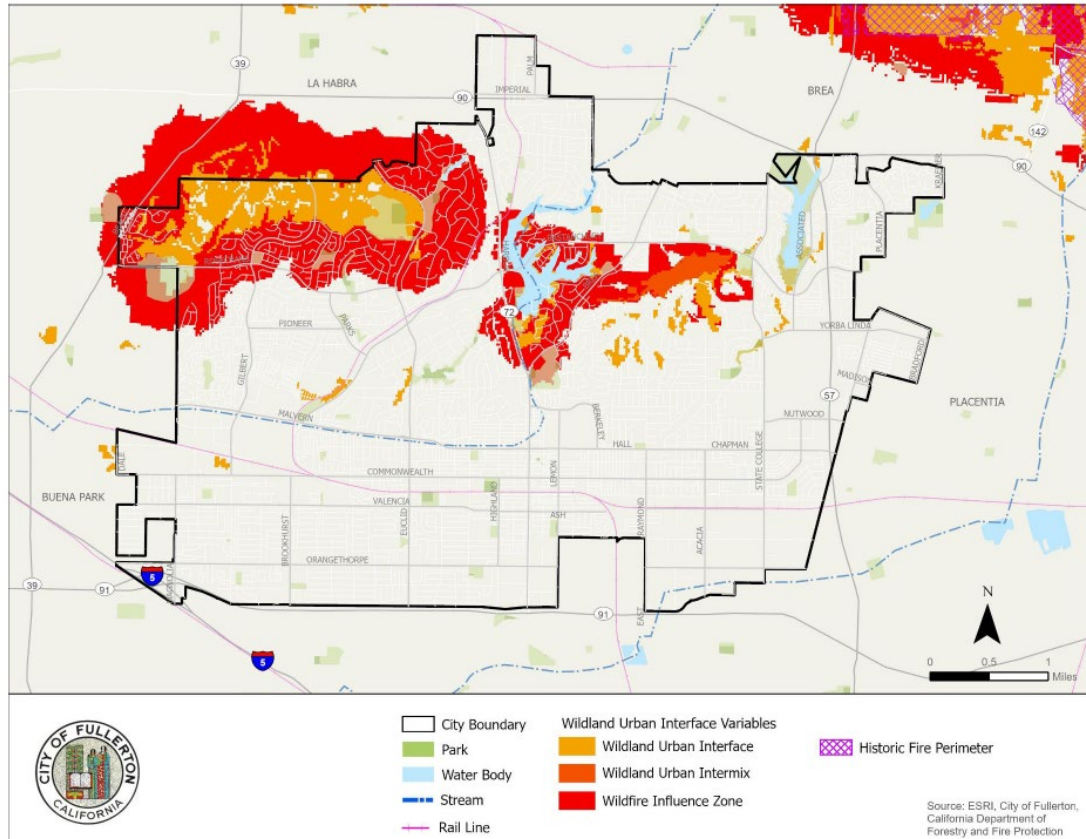
2020 Fullerton Local Hazard Mitigation Plan Update

Climate Adaptation Vulnerability Assessment (SB 379)



Safety Element Requirements

GOAL 12: PROACTIVELY ADDRESSING PUBLIC SAFETY CONCERNS. (EXISTING GOAL)



POLICY FOCUS:

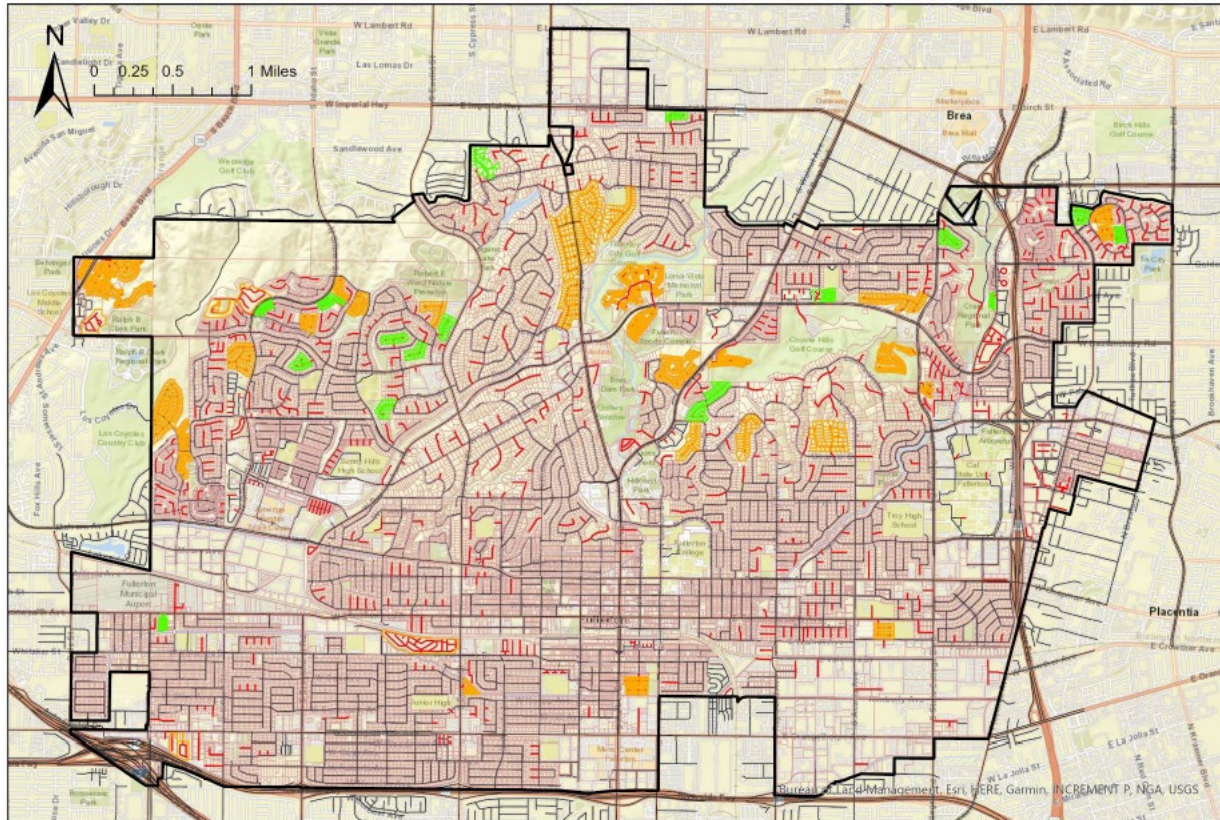
- Vegetation Management/Brush Clearance
- Fire Safe Regulations Requirements
- Historic fire perimeters
- Long term maintenance and operations
- Adequate water supply and infrastructure.

Key Policies – P12.4.2, P12.4.3, P12.14

Wildfire Hazards
(SB 1241)

Safety Element Requirements

GOAL 13: RESPONSIVE TO PUBLIC SAFETY NEEDS. (EXISTING GOAL)



Legend

- | | | |
|------------------------|-----------------------------------|----------------------------|
| Fullerton City Limits | Roadway Network | Constrained Access Parcels |
| Fullerton City Parcels | SB 99 Single Ingress/Egress Roads | Parcels of Concern |

POLICY FOCUS:

- Enhance existing evacuation routes
- Require adequate ingress/egress
- Reduce or eliminate evacuation constraints/challenges
- Identify single access neighborhoods.

New Policies P13.5.1 through P13.5.7

**Evacuation
Analysis
(SB 99)**

Safety Element Requirements

GOAL 26 (A): A COMMUNITY PREPARED FOR FUTURE CLIMATE RELATED IMPACTS. (NEW GOAL)

HAZARDS OF CONCERN:

- Wildfire
- Landslide
- Flooding



VULNERABILITIES OF CONCERN:

- Households in Poverty
- Persons Experiencing Homelessness
- Chronically Ill Individuals



**Climate
Adaptation
(SB 379)**

Safety Element Process



**Public Review Period
(October 2024)**



**Cal Fire Review Process
(June 24– July 9, 2024)**



**Board of Forestry and Fire Protection Approval
(July 23, 2024)**



**Planning Commission Approval
(Today)**



**City Council Approval
(TBD)**