

RESOLUTION NO. 2024-

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF
SANTA ANA TO APPROVE AND ADOPT THE CITY OF
SANTA ANA EMERGENCY OPERATIONS PLAN**

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SANTA ANA AS
FOLLOWS:

WHEREAS, Section 2-645 (Chapter 2, Article IV, Division 15) of the Santa Ana Municipal Code and Section 8610 of the California Emergency Services Act calls for the preparation and adoption of an Emergency Operations Plan to plan for, respond to and recover from any natural or human-caused disaster or any condition constituting a local or state emergency;

WHEREAS, the City of Santa Ana Emergency Operations Plan (“the Plan”) establishes the City of Santa Ana’s emergency organization, assigns tasks and responsibilities, specifies policies and procedures, and provides for coordination of the City’s response to emergencies;

WHEREAS, the Plan was developed in accordance with the standards and provisions of the National Incident Management System, the California Standardized Emergency Management System, the California State Emergency Plan and the Orange County Operational Area Emergency Operations Plan;

WHEREAS, the Plan was developed in coordination with all City Departments and Agencies, and all City Departments and Agencies have reviewed and approved their responsibilities under the Plan.

NOW THEREFORE, the Santa Ana City Council does hereby resolve as follows:

Section 1. The Santa Ana City Council does hereby approve and adopt the City of Santa Ana Emergency Operations Plan, attached hereto as **Exhibit A**;

Section 2. Any previous City of Santa Ana Emergency Operations Plan(s) are hereby superseded;

Section 3. All City Departments and Agencies with responsibilities under the Plan are directed to develop the necessary internal plans or procedures, and make sufficient staff and resources available to fulfill their responsibilities under the Plan;


Section 4. The City Manager or designee(s) are authorized to incorporate any required revisions or updates to the Plan, and to develop Annexes to the Plan to provide further guidance on specific emergency response operations.

Section 5. This Resolution shall take effect immediately upon its adoption by the City Council, and the City Clerk shall attest to and certify the vote adopting this Resolution.

ADOPTED this 21st day of May, 2024.

Valerie Amezcua
Mayor

APPROVED AS TO FORM:
Sonia R. Carvalho, City Attorney

By: 

Tamara Bogosian
Senior Assistant City Attorney

AYES: Councilmembers _____
NOES: Councilmembers _____
ABSTAIN: Councilmembers _____
NOT PRESENT: Councilmembers _____

CERTIFICATE OF ATTESTATION AND ORIGINALITY

I, Jennifer L. Hall, City Clerk, do hereby attest to and certify the attached Resolution No. 2024 - _____ to be the original resolution adopted by the City Council of the City of Santa Ana on May 21, 2024.

Date: _____

City Clerk
City of Santa Ana



City of Santa Ana Emergency Operations Plan

Emergency Operations Plan

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Letter of Promulgation

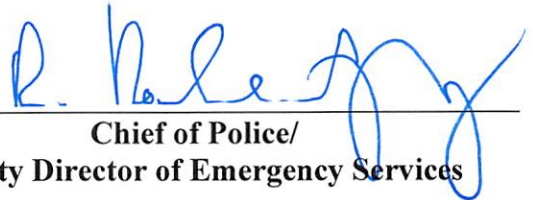
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Executive Director's Concurrences

The City of Santa Ana Emergency Operations Plan is the product of a joint development effort of all City Departments and Agencies. All City Departments and Agencies, having reviewed the Plan and the responsibilities the Plan places upon them, give their concurrence to the Plan:



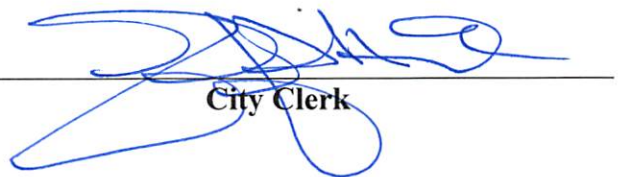
City Manager/
Director of Emergency Services



Chief of Police/
Deputy Director of Emergency Services



City Attorney




City Clerk



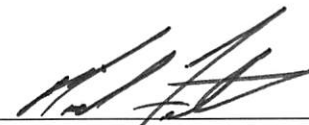
Executive Director of Community Development



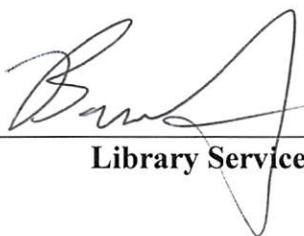
Executive Director of Finance and
Management Services



Executive Director of Human Resources



Chief Technology and Information Officer



Library Services Director



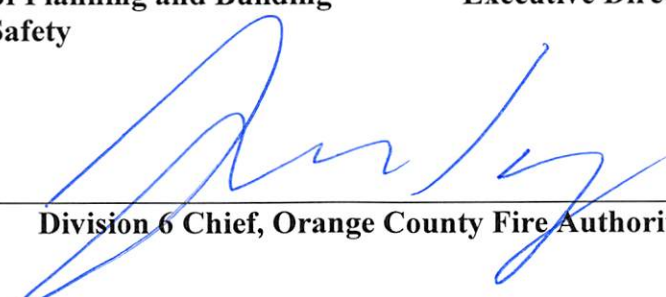
Executive Director of Parks, Recreation and
Community Services



Executive Director of Planning and Building
Safety



Executive Director of Public Works



Division 6 Chief, Orange County Fire Authority

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Record of Revisions to the Plan

Date of Revision	Plan Section or Element	Description of Revision	Prepared by	Approved by

Chapter 1 – Plan Introduction

1.1 Purpose and Scope

The Emergency Operations Plan (“EOP”) is the primary authority for coordinating response and recovery operations in the City of Santa Ana for incidents involving or threatening extensive loss of life or property, substantial disruption to the community’s infrastructure, or other debilitating impacts on the normal pattern of life within the community. This can include natural disasters, human-caused disasters (intentional or unintentional), failure of technological infrastructure, as well as significant pre-planned public events.

The EOP specifies actions to be taken to protect life, property and the environment by:

- Preventing disasters where possible,
- Reducing the community’s vulnerability to disasters that cannot be prevented,
- Establishing capabilities to protect the community from the effects of disasters,
- Responding effectively to the actual occurrence of disasters, and
- Providing continuity of government and delivery of essential services for the well-being and rapid recovery of the population.

The operational concepts in this EOP are not intended for day-to-day emergencies, which are handled on a regular basis by the Santa Ana Police Department, Orange County Fire Authority and other City departments. Rather, its focus is on exceptional situations where normally available resources are exhausted or are expected to be exhausted soon, or where the threat to lives or property is so great that the City needs to expand beyond day-to-day operations and normally available resources and implement unusual, expanded or long-term emergency response actions in order to bring the incident to a successful resolution.

The EOP is typically implemented following, or in anticipation of, larger emergencies or complex events that require the response of multiple city departments, external agencies, other jurisdictions or levels of government, or mutual aid. The EOP provides a framework to manage the response of multiple agencies, coordinate resources from outside the City, integrate other levels of government, and sustain response and recovery activities over multiple operational periods.

Any incident can potentially escalate into a larger or more complex emergency; as such, this EOP should always be kept under consideration by every responder or staff member involved in managing any incident.

In accordance with this EOP, emergency response personnel, City officials and staff are encouraged to request support and resources proactively and to consider implementation of this Plan, or activation of the City Emergency Operations Center (EOC), if it would assist in the successful resolution of the incident. Even if escalation of the event doesn’t occur, any activation of the EOP or EOC is a valuable training opportunity and learning experience for staff. There is little harm in early activation, but consequences for a delayed or missed activation could include lost lives or property or a public perception that the City responded slowly or inadequately.

Implementation of this Plan and/or activation of the City’s EOC should be considered if one or more of the following factors arise in an incident:

- The number of involved agencies, departments, or organizations may require or benefit from coordination from a centralized location.
- The number of individual incidents occurring simultaneously may require or benefit from coordination from a centralized location.
- The City’s resources may be depleted, requiring the activation of mutual aid.

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- The anticipated duration of the incident is greater than 12 hours, or the response to the incident needs to be divided into multiple operational periods.
- There is an anticipation that the incident may escalate or worsen over time.
- External (non-City) agencies or organizations are responding to the incident.
- Protective actions or emergency response measures will have a broad impact on the public.
- The event triggers distribution of an emergency mass-notification to the public.
- A Proclamation of Emergency has been issued or is being considered.
- Neighboring or overlapping jurisdictions have activated EOC(s) or proclaimed an emergency.

This EOP will:

- Identify the scope of potential hazards which form the basis of the City's emergency planning,
- Identify authorities and assign responsibilities for planning and response activities,
- Establish the City's Emergency Organization that will manage the emergency response,
- Describe the resources available to support emergency response activities,
- Establish City policy and procedures for response activities,
- Outline pre-planned emergency response measures and protective actions,
- Identify other jurisdictions, agencies, resources or organizations with which planning and emergency response should be coordinated, and
- Provide a basis for staff training and community preparedness education.

This Plan is based on the concepts and principles of the Incident Command System, the California Standardized Emergency Management System (SEMS), and the National Incident Management System (NIMS). Through this Plan, the City formally adopts SEMS and NIMS as its all-hazards incident management systems. The Plan identifies the City's role in the overall SEMS/NIMS structure and describes the responsibilities of federal, state and local government entities in emergency operations.

This EOP is a document intended to be read, exercised and understood prior to its activation in an emergency. Personnel assigned a responsibility in this plan are also responsible for having a working knowledge of the functions and actions described herein.

Each City department or agency constituting an element of the City's Emergency Organization is responsible for assuring the preparation and maintenance of appropriate and current Standard Operating Procedures (SOPs), emergency operating procedures, resources and checklists relevant to their duties within this Plan. These SOPs will provide detailed information on how assigned responsibilities are performed to support EOP implementation and ensure a successful response to emergency situations. Emergency personnel should be acquainted with these SOPs, receive periodic training or review on the policies and procedures contained within them, and should assist in their development.

The Plan is intended to be a dynamic preparedness document, to be reviewed annually, with changes to improve the SOPs and checklists incorporated into the Plan as they are identified.

While many of the preparedness, response and recovery functions described in this Plan may be performed similarly in any form of emergency, few disasters are routine. Events unfold quickly and unexpectedly, and actions are taken and decisions made in an environment of limited information and rapid need. As such, this Plan is a starting point, and incident managers retain the flexibility to modify procedures, organizational structure or response measures to accomplish the mission in the context of a specific hazard scenario or event.

1.2 Audience and Disclosures

The intended audience for this EOP consists of City departments and staff members with emergency management responsibilities; other agencies or non-governmental organizations partnering with the City in public safety, emergency response or recovery roles; and elected officials. The Plan may also be a reference for managers from other jurisdictions, the Orange County Operational Area, state and federal government, other non-governmental organizations and interested members of the public.

Portions of this document may contain sensitive information pertaining to the mobilization, deployment and tactical operations of City government or partner agencies in response to emergencies. Although the majority of the Plan is available for public review, portions that include personal privacy information or information with significant implications on city, state or national security or response operations may be redacted or secluded in parts or attachments that are exempt from public disclosure under the provisions of the California Public Records Act §6254.

1.3 Plan Organization and How to Use this Plan

This Plan should provide a thorough understanding of the City's emergency organization and the process of preparing for, responding to and recovering from disasters, unusual emergencies or significant events. Use of the Plan will differ according to the needs of the reader. All City staff should be familiar with the Plan, although only a few will use the entire document and most will focus their attention on parts of the Plan or Annexes specific to their needs and responsibilities. The Plan provides the basis for staff and departments to develop specific, detailed checklists and standard operating procedures to support the duties assigned to them in the Plan or during response to an event.

By using this EOP appropriately, City departments and agency representatives supporting the City should:

- Know what they and other organizations are responsible for doing,
- Know how to perform their functions,
- Avoid inefficiencies, duplications, and oversights in performing functions, and
- Be able to coordinate effective response and recovery operations across organizations and jurisdictions.

This EOP is separated into three parts. Each part and its intended purpose are described below:

Part I – Basic Plan: The Basic Plan consists of fundamental information that explains response and recovery operations in the City of Santa Ana. It is an overview of emergency management in the City and is not a detailed operational document. The Basic Plan should be reviewed and understood by EOC staff (identified in Chapter 4) and all response and recovery workers in advance of an emergency.

The Basic Plan consists of the following five chapters:

Chapter 1 - Introduction – An overview of the purpose and role of the EOP; assumptions, authorities and references for the Plan; and the process for developing, approving and maintaining the Plan.

Chapter 2 - Community Profile and Hazard Assessment – An overview of the functions of City government and characteristics of the community and how these characteristics may affect response and recovery activities, and an assessment of the potential hazards and threats the City may face.

Chapter 3 - Emergency Organization and Concept of Operations – No city or governmental body has the resources to successfully manage a large-scale emergency or catastrophic event single-handedly. Therefore, Santa Ana's Emergency Organization is built upon close partnerships and coordination with

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various public safety agencies, County departments, private contractors and non-governmental organizations. The City's concept of operations is built upon proven response concepts and elements of the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS); and upon existing response standards for mutual aid, alerting and warning, and operational continuity. EOC staff should have a clear understanding of these concepts and systems as they are inherent to successful emergency operations. Before staff members can appropriately execute their responsibilities, they must understand the underlying systems that govern emergency operations.

Chapter 4 - Emergency Operations Center Functionality – This chapter is the most significant element of the Basic Plan. It describes how the emergency response is organized, assigns roles and responsibilities, provides for information and planning functions, and identifies the EOC's operational requirements. This chapter may be referenced frequently during EOC activations. The EOC is a dynamic environment that provides many resources, but also poses numerous challenges. This chapter is designed to ensure the efficiency of EOC operations by describing the proper use of tools and resources to meet the challenges of the event.

Chapter 5 - Recovery Operations – This chapter describes the concept of operations for post-event recovery activities, to begin the process of restoring normal levels of service and quality of life to the community. Like the Concept of Operations chapter, this chapter should be understood by recovery organizations in advance of activation and may also be referenced during an emergency.

Part II – Functional Annexes: This Part, divided into two chapters, provides checklists and procedures to be used by EOC personnel to perform assigned tasks or functions during actual emergencies or exercises. Each City department or agency assigned responsibility in this Plan for a position or function in the EOC will prepare and maintain department, functional or position-specific Standard Operating Procedures (SOPs) detailing the policies, notification rosters, resource lists and specific steps to accomplish the functions assigned to them in this EOP.

In some cases, the attachments are applicable to all positions and tasks; in other cases they provide information to support the execution of a specific task.

Chapter 6 - SEMS/EOC Position Checklists - These *EOC position-specific* checklists correspond to each SEMS EOC Position in the City's EOC Organization Chart. They are designed to inform each person assigned to a position in the EOC of the responsibilities of that position. Position checklists do not provide detail on what to do during an emergency response (which is developed through Action Plans during EOC activations); rather they are to keep individuals on task by providing reminders of what responsibilities they must attend to.

Chapter 7 - Emergency Support Function Procedures - These *function-specific* procedures provide further guidance on how to perform certain functions or tasks that may be required during emergency operations. For instance, EOC Position Checklists (above) specify that the Planning/Intelligence Section is responsible for developing EOC Action Plans, while these Function Procedures provide templates and references in how to do so. Each department assigned primary responsibility for a function in the EOC is responsible for the development and maintenance of the checklists and procedures necessary to fulfill that function.

Part III – Hazard Annexes: These annexes are hazard-specific plans complementary to the EOP, which should be used during specific emergency situations (earthquake, storms, etc.) that may require specific planning beyond the all-hazards approach within the Basic Plan, providing checklists of concerns or functions necessary to address the specific type of incident.

1.4 Plan Assumptions

- The United States Department of Homeland Security (USDHS) and Federal Emergency Management Agency (FEMA) are responsible for establishing and developing guidance policies and programs for emergency management at the federal, state and local levels; and to develop national capabilities to mitigate, prepare for, respond to, and recover from the full range of natural and technological disasters and national security emergencies.
- State and local emergency management programs are responsible for developing and maintaining effective capabilities to mitigate, prepare for, respond to, and recover from the effects of emergencies within their jurisdiction.
- The City of Santa Ana has primary responsibility for the safety, well-being and quality of life of its citizens and for the protective actions and emergency response measures to save lives, minimize injury to persons or damage to property, and protect the environment in the City.
- The City of Santa Ana may not itself possess all of the tactical resources or equipment to respond to all emergencies. The City will collaborate with regional public safety agencies, other levels of government, private vendors and other entities to provide resources to respond to the event. It is assumed these external resources will be available to the City in time of emergency.
- The City Manager, as Director of Emergency Services, or designated alternates, will coordinate the City's disaster response in conformance with the Emergency Operations Plan.
- The City of Santa Ana will utilize the Incident Command System (ICS), the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) to manage emergency response operations.
- The City of Santa Ana will participate in the Orange County Operational Area (see Chapter 3 for more information on the Operational Area concept). For day-to-day operations, this includes active participation in Operational Area meetings, trainings and planning groups to develop and support regional plans and programs. In an emergency, this means that the City will rely on the Operational Area for support and assistance with resource management, information management, mutual aid and other incident management efforts.
- The City will devote all available resources to meet the demands of an emergency. Mutual aid assistance will be requested when emergency response requirements exceed the City's ability to meet them. The City will commit its resources to a reasonable degree before requesting mutual aid assistance.
- While it is likely that outside assistance would be available in large-scale disaster situations affecting the City and plans have been developed to facilitate coordination of this assistance, it is necessary for the City to plan for and be prepared to conduct disaster response and recovery operations independently, to the fullest extent possible.
- In a major emergency, initial efforts of the City, its emergency services, and mutual aid agencies will be focused on lifesaving and critical functions, such as rescue, emergency medical care, firefighting, maintaining law and order, and restoring vital government, transportation, public utility and other critical operations and facilities. Disaster relief operations, such as sheltering or distribution of food and water, may not begin immediately; residents are expected to be able to sustain themselves for 72 hours or more, until sufficient disaster relief services are in place.
- Management of all City departments and agencies are aware of the existence of this EOP and the parts that are relevant to their responsibilities, and have prepared to fulfill those responsibilities.
- Appropriate City staff and other responders will be properly trained on this EOP and their assigned emergency roles and responsibilities, and will participate in training and exercises.

1.5 Relationship to Other Plans and Documents

This EOP is the primary document used by the City of Santa Ana to describe the conduct of emergency management activities and emergency operations during an incident or event, and it provides a conceptual framework for emergency management planning within the City.

The EOP contributes to the City's emergency management program by describing how activities will be conducted within City limits and how support will be requested and provided in the form of mutual aid from the Orange County Operational Area, the State of California or beyond. When emergencies or disasters necessitate resource support from federal, state, private or non-profit sources, the EOP will serve as the primary guide for requesting and managing those resources.

At the same time, the EOP is not a stand-alone document. As the complexity of an emergency grows and requires the participation of external organizations with additional capabilities or resources, this plan will integrate with the plans of other entities brought in to support the City of Santa Ana. This plan is designed to be flexible enough that the City's capabilities can adapt to a changing response environment and to the needs of supporting organizations.

Plans, guidelines or documents that support this EOP, provide the City of Santa Ana with authority to conduct emergency operations, or may be relied on to manage an emergency are listed in Section 1.6 below. When dictated by the situation, additional ordinances or emergency regulations may be enacted by City, County or State authorities through emergency proclamations.

1.6 Authorities and References

FEDERAL REFERENCES

- Homeland Security Act of 2002
- Homeland Security Presidential Directive (HSPD) 5, Management of Domestic Incidents and the National Incident Management System (NIMS)
- Homeland Security Presidential Directive/HSPD 8, National Preparedness
- US Department of Homeland Security, National Response Framework (NRF)
- US Department of Homeland Security, National Disaster Recovery Framework (NDRF)
- Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988
- Federal Civil Defense Act of 1950
- Federal Disaster Relief Act of 1974

CALIFORNIA REFERENCES

- California Emergency Services Act, CA Government Code Chapter 7 of Division 1 of Title 2
 - Confers upon the governor and chief executives and governing bodies of political subdivisions specified powers in an emergency, establishes the California Office of Emergency Services, and provides for the rendering of mutual aid by state government and agencies and by political subdivisions.
- California State Emergency Plan
 - The California State Emergency Plan provides overall statewide authorities and responsibilities and describes the functions and operations of government at all levels during extraordinary emergencies. Section 8568 of the Emergency Services Act states that "The State Emergency Plan shall be in effect in each political subdivision of the state, and the governing body of each political subdivision shall take such action as may be necessary to carry out the provisions thereof". Local emergency plans are therefore considered to be extensions of the California Emergency Plan.

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- Standardized Emergency Management System (SEMS) Regulations and Guidelines, California Code of Regulations, Chapter 1 of Division 2 of Title 19
 - Establishes SEMS to provide a standardized, flexible and adaptable response to emergencies involving multiple agencies or jurisdictions, including incident command systems, multi-agency/inter-agency coordination, the operational area concept, and mutual aid systems.
- California Disaster Assistance Act, CA Government Code Chapter 7.5, Division 1 of Title 2
 - Provides for resources and financial assistance from the state to political subdivisions for the repair, restoration or replacement of real property damaged or destroyed by disaster.
- Disaster Service Workers, CA Government Code Chapter 8 of Division 4 of Title 1
 - In the exercise of the police power of the state in protection of its citizens and resources, all public employees are declared to be disaster service workers subject to such disaster activities as may be assigned to them by their superior or by law.
- California Master Mutual Aid Agreement
- California Law Enforcement Mutual Aid Plan
- California Fire Service and Rescue Emergency Mutual Aid Plan
- California Fire and Rescue Operations Plan
- California Emergency Managers Mutual Aid Plan
- State of California Hazardous Materials Plan
- California Emergency Resources Management Plan
- Disaster Assistance Procedure Manual
- OES Earthquake Recovery Manual for Local Governments (1993)
- California Terrorism Response Plan
- Orders and Regulations which may be Selectively Promulgated by the Governor during a State of Emergency or State of War Emergency

ORANGE COUNTY REFERENCES

- County of Orange and Orange County Operational Area Emergency Operations Plan
- Orange County Operational Area Emergency Operations Plan Annexes:
 - Aircraft Accident Annex
 - Alert and Warning Plan
 - Disease Outbreak Response Annex
 - Extreme Temperature Annex
 - Family Assistance Center Plan
 - Flood Annex
 - Joint Information System/Joint Information Center Annex
 - Mass Care and Shelter Annex
 - Mass Evacuation Annex
 - Mass Fatality Plan
 - Power Outage Annex
 - Rail Accident Annex
 - Recovery Annex
 - Strategic National Stockpile (SNS) Annex and POD Plans
 - Terrorism Annex
 - Volunteer and Donations Management
- Orange County Operational Area Agreement
- Orange County Law Enforcement Mutual Aid Plan
- Orange County Fire Service Operational Area Mutual Aid Plan
- Orange County Fire Authority Hazardous Materials Area Plans
- Orange County Operational Area Emergency Alert System (EAS) Plan

CITY REFERENCES

- Santa Ana Municipal Code, Chapter 2, Article IV, Division 15: Emergency Services
- City Resolution adopting the City's Emergency Operations Plan
- City Resolution adopting the Master Mutual Aid Agreement

1.7 Americans with Disabilities Act and Persons with Disabilities or Access and Functional Needs

The City of Santa Ana strives to incorporate the whole community perspective in its emergency planning. By planning for the whole community, complexities in the diversity of Santa Ana are assimilated into the City's emergency planning strategy, specifically including persons with disabilities or access and functional needs. The City of Santa Ana adopts the Orange County Operational Area definition of Disabilities and Access or Functional Needs:

"Populations whose members may have additional needs before, during and after an incident in functional areas, including but not limited to: maintaining independence and the ability to perform the activities of daily living, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities; who live in institutionalized settings; who are elderly; who are children; who are from diverse cultures; who have limited English proficiency or are non-English speaking; or who are transportation disadvantaged."

Having recognized the need to be inclusive in its emergency planning, the Orange County Operational Area (OA) formed the Orange County Disabilities and Access and Functional Needs Working Group in 2011 to strengthen partnerships with the disability community and those with access and functional needs. This team includes representatives from county agencies, local jurisdictions and nonprofit organizations serving people with disabilities and those with access and functional needs in Orange County. This group's instrumental efforts have turned the OA towards more inclusive emergency planning for the whole community. All OA emergency plans are reviewed by this Working Group to ensure input from and accommodation of the needs of the disabilities community. The City of Santa Ana participates in this Working Group and develops its emergency plans from those reviewed and approved by this group.

Furthermore, the City and Operational Area are committed to maximizing compliance with the Americans with Disabilities Act and providing the most effective service to all residents and visitors. As such, the City adheres to the guidelines outlined below:

- Disability will not prevent access to services or facilities provided by the City.
- The City will not exclude or deny benefits of any sort based on a disability, access or functional need.
- The City will work to accommodate people with disabilities or access and functional needs in the most integrated setting possible.
- During all phases of disaster response, the City will make reasonable modifications to policies, practices and procedures, if necessary, to ensure programmatic and architectural access to all.
- The City will shelter people with disabilities or access and functional needs with their families, friends and/or neighbors as feasible in the most integrated setting possible.

1.8 Plan Development, Approval and Revision

The development of an Emergency Operations Plan is a cooperative effort among all City departments and agencies that have an emergency role. This EOP is developed from prior versions of the Plan, existing plans of nearby or similarly-situated jurisdictions (including the County of Orange and Orange County Operational Area EOP), and from current state and federal EOP-development guides and checklists, adopting the best practices, current techniques and required elements from each. The planning process is

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designed to consider the needs of the community, incorporate the capabilities and limitations of city departments and supporting agencies, and maximize resources. Each City department and agency is needed in the development of the EOP, and each is solicited for input, current procedures, and lessons learned for incorporation into the EOP consistent with its overall purpose and structure.

The City's Emergency Operations Coordinator has the lead responsibility for EOP development and planning with responsibilities for:

- Communicating information within the City of Santa Ana on EOP requirements, guidelines and needs and coordinating EOP development among City departments and agencies.
- Coordinating with other local governments, the Operational Area, and non-governmental organizations on development of the EOP.
- Incorporating SEMS and NIMS into the EOP and associated procedures.
- Incorporating SEMS and NIMS into City emergency ordinances, agreements, memorandums of understanding, etc.
- Identification of special districts and other governmental agencies that operate or provide services within the City and providing for coordination with these districts during emergencies.
- Identification of local volunteer and private agencies that have an emergency response role and providing for coordination during emergencies.

This EOP has been reviewed by all City departments and agencies assigned a primary function in the City of Santa Ana Emergency Organization as defined in the Plan. Each City department and agency is responsible for ensuring its willingness and ability to perform the functions assigned in this Plan. Each Department Director attests to such concurrence in the signed concurrence agreement included in the Plan Preface. Such signature confirms the Department Director has reviewed the EOP and agrees with its content at the time of publishing.

Upon review and written concurrence by City departments and agencies, the Basic Plan (Part I) is officially approved and adopted by the City Council. A letter of promulgation is located in the Plan Preface, which validates and authorizes the concepts, roles and responsibilities, and emergency management system for the City. Annexes to this Plan (Parts II and III) are approved at the Department Director level, as they are more procedural documents and may be revised or amended more frequently.

The EOP is a living document, subject to revision based on agency reorganization, new laws, and experience with exercises and actual activations. The Emergency Operations Coordinator will review the EOP annually and solicit input from City departments and agencies to ensure that Plan elements are valid and current and to incorporate revisions to enhance response and recovery operations. Changes in government structure and emergency response organizations will also be considered for EOP revisions. Revisions made after adoption will be listed in the Record of Revisions located in the Plan Preface.

In addition to the Basic Plan in Part I of the EOP, Part II (Functional Annexes) and Part III (Hazard Annexes) may contain Standard Operating Procedures (SOPs) detailing specific steps, procedures, resource lists or other guidance for accomplishing the functions assigned in the EOP. Each department or agency with responsibility for an EOC position or function in this EOP will prepare SOPs necessary to fulfill those responsibilities and review and revise them on a regular basis.

Revisions or additions to the EOP that are identified in periodic reviews will be presented to the City Council for adoption and incorporation into the EOP. The Emergency Operations Coordinator will be responsible for maintaining records of EOP revisions and for distribution of revisions to all Plan recipients.

Chapter 2 – City of Santa Ana Community Profile and Hazard Assessment

2.1 Community Profile

2.1.1 History

Don Gaspar de Portolá, a Spanish expedition leader, discovered a river valley in Southern California on July 26, 1769. He christened the valley “Santa Ana” in honor of Saint Anne. A Spanish soldier named José Antonio Yorba and his nephew Juan Peralta were given a Spanish land grant for the area after the commencement of the Mexican War of Independence in 1810. This area, which Yorba called the Rancho Santiago de Santa Ana, encompassed a large portion of what is now known as Orange County, and he developed the lands for cattle grazing and productive farmland.¹

In 1869, William H. Spurgeon purchased 70 acres of the original land grant from the Yorba family and plotted a town site. The new town was given the name of Santa Ana. In 1886, Santa Ana was incorporated as a city. When Orange County split from Los Angeles County three years later, Santa Ana was designated as the county seat.²

Santa Ana grew quickly from a population of 2,000 in 1886 to almost 8,500 in 1910. In 1878, the Southern Pacific Railroad built a line from Los Angeles that terminated in Santa Ana, integrating the City within the burgeoning Los Angeles metropolitan area. This was followed by the Santa Fe Railroad and the Pacific Electric Railroad, which both ran routes by way of Santa Ana and facilitated the growth of the City. Adding to the transportation infrastructure, Firestone Boulevard was constructed in the mid-1930s and provided a direct automobile route between Los Angeles and Santa Ana.³

Prior to World War II, the City was a prosperous agricultural hub of Anglo-European farmers that utilized Mexican migrant labor to sustain the region’s economy. The post-war boom of the 1950s left the City with a population of over 100,000 residents to work in emerging manufacturing and military industries. During the advent of the freeway era, Firestone Boulevard was incorporated into the larger Santa Ana Freeway project (I-5) in 1953, furthering growth in the region.⁴

Since the 1970s, Santa Ana has experienced a dramatic demographic shift and now serves as home to one of the largest concentrations of Mexican-Americans in the United States. The growing population has allowed the Santa Ana community to emerge as a significant economic and cultural force in the region.⁵ Known today as “Downtown Orange County”, Santa Ana remains the seat of county, state and federal government offices and courts, serves as the transportation hub of Orange County and is a headquarters location for major businesses and industries and large retail shopping centers.

2.1.2 Geography and Geology

Santa Ana is located on 27.3 square miles⁶ between the Santa Ana Mountains to the east and the Pacific Coast, which is approximately 10 miles to the west. It is slightly northwest of the geographic center of Orange County; however, if one excludes the undevelopable southeastern portion of the County, which contains the Cleveland National Forest, Santa Ana is at the geographic center of inhabited and developed Orange County. The City is bordered to the north by the Cities of Garden Grove and Orange, to the east by the City of Tustin, to the south by the Cities of Irvine and Costa Mesa, and to the west by the Cities of Fountain Valley and Westminster (Figure below).

¹ From <http://www.santa-ana.org/facts/>; *Santa Ana’s Logan Barrio* by Mary Garcia

² From <http://www.santa-ana.org/facts/>; *Santa Ana’s Logan Barrio* by Mary Garcia

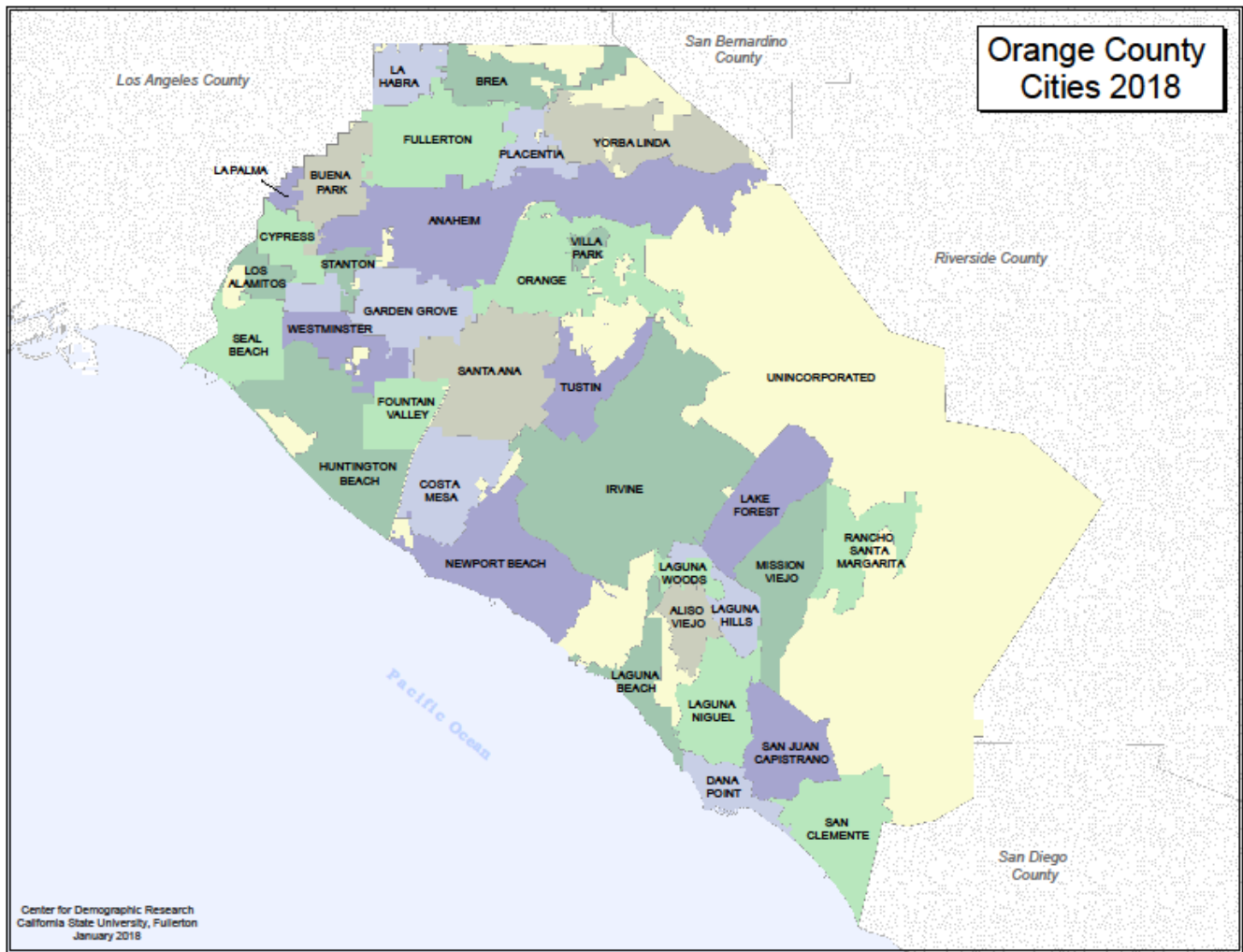
³ From *Santa Ana’s Logan Barrio* by Mary Garcia and GP Circulation Element

⁴ From *Santa Ana’s Logan Barrio* by Mary Garcia and GP Circulation Element

⁵ From *Santa Ana’s Logan Barrio* by Mary Garcia; General Plan (?)

⁶ Santa Ana City Public Works Agency, State Plane NAD 83, Zone 406 Projection; <http://www.ci.santa-ana.ca.us/facts/>

Figure 12 City Location and Borders within Orange County



The City is almost completely developed and any new development will largely consist of redevelopment and infill development on remaining vacant and underutilized parcels. Streets are laid out in a north-south and east-west grid pattern. Santa Ana Police Department divides the City into quadrants with the intersection of 1st Street and Flower Street as the center-point. East and West 1st Street divides the northern and southern halves of the City, and Flower Street divides the eastern and western halves, creating the Northeast, Southeast, South Coast (southwest) and West End (northwest) districts (see Figure 21 below).

Topographically, the City consists of a flat, low-lying plain approximately 135 feet above sea level with little elevation change throughout the City. The Santa Ana River, a 96-mile long waterway and the largest river in Southern California, runs through the City and serves as the major drainage channel. The Santa Ana River is non-navigable and mostly channelized (concrete-lined) and is usually dry or very low flowing, except during rainfall, due to the construction of the Prado and Seven Oaks Dams to the northeast of Orange County. Nevertheless, much of the City lies within the historic floodplain of the River and flooding is still possible during storm events or dam failure. Santiago Creek, a major tributary, runs through the Cities of Tustin, Orange and Santa Ana and provides water resources and drainage to the region. Santiago Creek is also low flowing except during rainfall, but is not channelized and is susceptible to flooding or creek bed erosion during storm events. A number of 100-year and 500-year flood plains are located in the City.⁷

⁷ GP Land Use Element; Ped Bike Master Plan

Figure 13 100- and 500-Year Floodplains



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No active, potentially active, or inactive earthquake faults are known to exist in Santa Ana; however, the San Joaquin Hills Fault runs along the 405 Freeway just outside the southern border of the City. The City is also located in close proximity to the Newport-Inglewood Fault Zone and the Whittier-Elsinore Fault Zone, two major faults in the Southern California region. The San Andreas Fault, the largest fault in California, is less than 50 miles from Santa Ana and would affect the City should a major earthquake occur. The south-central portions of the City and areas with lower elevations along the Santa Ana River may be subject to liquefaction in the event of a major earthquake.⁸

Figure 14 Orange County Earthquake Fault Zones



Notes on Figure 14: The fault touching the right margin of the map is the Elsinore Fault but is incorrectly labeled the Whittier Fault. The Whittier Fault lies at the top center where it is correctly labeled. The San Joaquin Hills Fault does not appear on this map but runs along the 405 Freeway south of the City border.

⁸ GP Land Use Element

2.1.3 Climate

Santa Ana's climate is considered to be a steppe or semi-arid climate, with little rainfall throughout the year. The annual season average rainfall between 1908 and 2015 was 12.82 inches, compared to the season maximum for the 1940-1941 period at 32.14 inches⁹. Santa Ana can also experience multi-year droughts with as little as 2 to 3 inches per year.¹⁰

Monthly seasonal average temperatures range from a minimum of 55.3°F to a maximum of 75.0°F in the winter, and a minimum of 68.0°F and a maximum of 81.6°F in the summer.¹¹ Temperatures sometimes exceed 100 degrees for several days due to summer or fall heat waves or strong Santa Ana wind events. Temperatures infrequently drop close to freezing during some winter nights.¹²

2.1.4 Population and Demographics

Santa Ana has a population of 342,930 residents¹³. The City makes up approximately 11% of Orange County's 3.18 million people¹⁴ and is second only to Anaheim in terms of largest cities by population in Orange County. Santa Ana is also the 11th largest city in California¹⁵ and the 57th largest city in the United States.¹⁶ Santa Ana has a population density of over 12,500 people per square mile, making it one of the densest cities in Orange County¹⁷ and one of the most densely populated large cities in the United States.

2.1.4.1 Race and Ethnicity

The City of Santa Ana is a majority-minority community. 78.6% of the population identifies as Hispanic, most of whom are of Mexican origin. Asians comprise 10.3% of the remaining population. Whites comprise 9.2%, and all others 1.9%. Over 47% of the population is foreign-born, and 82.8% speak a language other than English.¹⁸

RACE AND ETHNICITY	
White	9.2%
Hispanic	78.6%
Asian	10.3%
All Others	1.9%
Source: ACS 2010-2014 5-Year Estimates	

⁹ <http://en.climate-data.org/location/715001/>; O.C. Public Facilities & Resources Department, 4/28/2016 (<http://www.santa-ana.org/facts/>)

¹⁰ http://ocwatersheds.com/rainrecords/rainfalldata/historic_data

¹¹ <http://en.climate-data.org/location/715001/>; O.C. Public Facilities & Resources Department, 4/28/2016 (<http://www.santa-ana.org/facts/>)

¹² For the temperature cites, see the attached Santa Ana Weather History doc. This is a report generated by NOAA from records of the weather station at OCFA Station 75.

¹³ CA DOF 2016 Estimates

¹⁴ CA DOF 2016 Estimates

¹⁵ CA DOF 2016 Estimates

¹⁶ (Cities with populations over 100,000); 2010 Census

¹⁷ Orange County Progress Report

¹⁸ 2014 ACS 5-Year Estimates

PRIMARY LANGUAGE	
Population 5 years and over	
Speak only English	17.2%
Speak English less than "very well"	45.3%
Speak a language other than English	82.8%
Spanish or Spanish Creole	72.3%
Other Indo-European languages	0.8%
Asian and Pacific Island languages	9.5%
Other languages	0.2%
Source: ACS 2010-2014 5-Year Estimates	

2.1.4.2 Age

Santa Ana has a relatively young population, with the median resident age at 29.7 years. In comparison, the median age for California is 35.6 and 37.4 for the United States overall. 32.4% of Santa Ana residents are under the age of 20, and in the 2010 Census, the City was considered to have one of the youngest populations among larger cities in the nation.¹⁹

AGE	
Under 20	32.4%
20-24	9.4%
25-44	31.2%
45-64	19.8%
65 and over	7.2%
Source: ACS 2010-2014 5-Year Estimates	

2.1.4.3 Households

Santa Ana currently has an average household size of approximately 4.47 persons per household, which is one of the largest in the region.²⁰ Research has shown that immigrant households tend to be larger and frequently include extended or multigenerational families. Second and third generations of immigrant families, who are often more affluent than first generations, typically have smaller family sizes and prefer similar housing opportunities to nonimmigrants²¹.

According to the U.S. 2014 Poverty Guidelines, the poverty level for households with four to five people is \$23,850-\$27,910.²² The 2014 ACS 5-Year Estimates report that 19.5% of families in Santa Ana live below the poverty level.²³ Household income tends to limit mobility, and 6.7% of households in the City do not have access to a vehicle. Nearly 55% of Santa Ana residents, versus households, do not have access to a personal vehicle, as compared to 37% for Orange County.²⁴

¹⁹ 2014 ACS 5-year estimates; Ped Bike Master Plan

²⁰ CA DOF 2016 Population and Housing Estimates; Ped Bike Master Plan

²¹ 2014-2021 Housing Element

²² <https://aspe.hhs.gov/2014-poverty-guidelines>

²³ 2014 ACS 5-Year Estimates

²⁴ 2014 ACS 5-Year Estimates

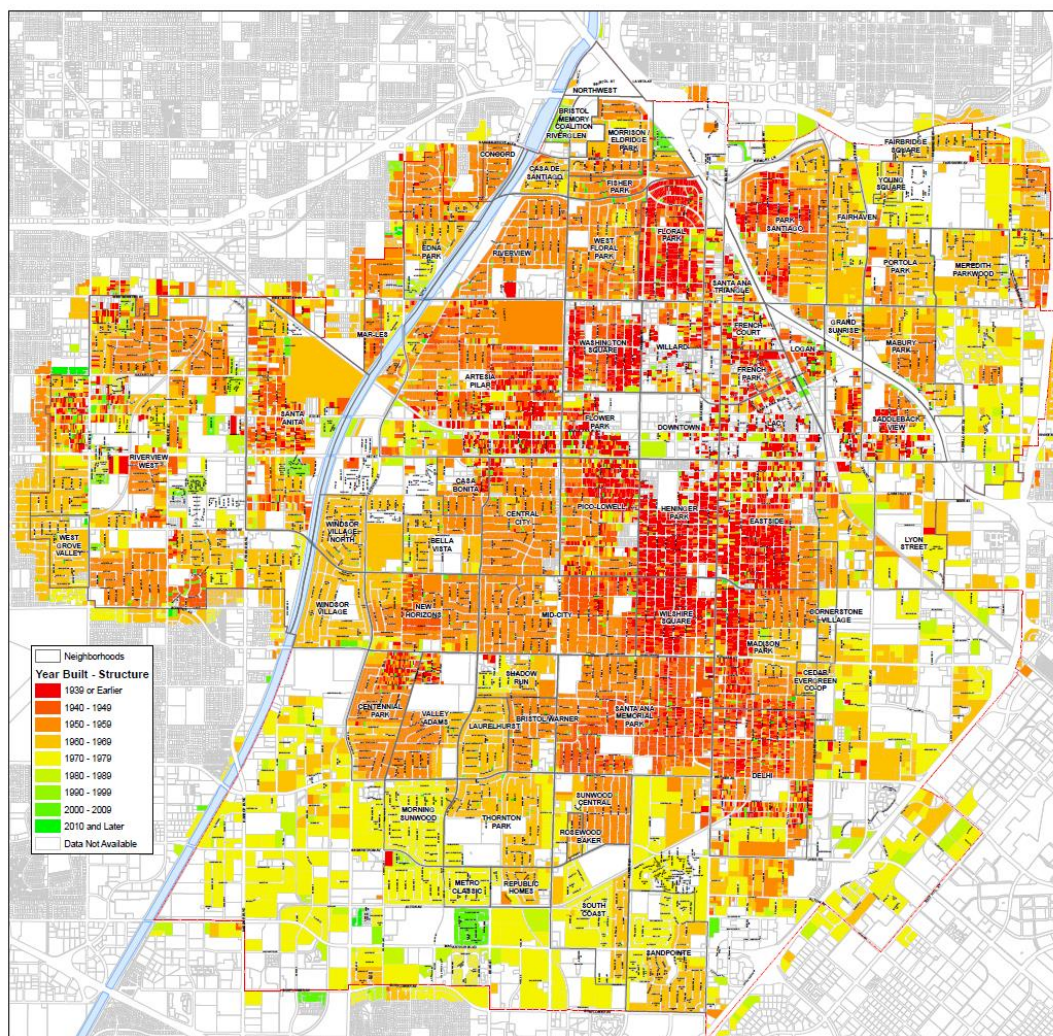
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HOUSING TYPE	
Single Detached	45.87%
Single Attached	7.33%
Two to Four	9.72%
Five or More	31.86%
Mobile Home	5.22%
Total Housing Units	100.00%
Persons Per Household	4.47
Vacancy Rate	2.40%
Source: CA DOF 2016 Population and Housing Estimates	

YEAR STRUCTURE BUILT	
After 2000	3.5%
1990s	5.3%
1980s	10.7%
1970s	25.8%
1960s or before	54.7%
Source: ACS 2010-2014 5-Year Estimates	

VEHICLES PER HOUSING UNIT	
No vehicles available	6.7%
1 vehicle available	28.6%
2 vehicles available	35.6%
3 or more vehicles available	29.1%
Source: ACS 2010-2014 5-Year Estimates	

Figure 18 Year Structures Built



2.1.4.4 Persons with Disabilities

Estimates from the U.S. Census Bureau indicate that there are 28,538 persons with a disability in Santa Ana, which is 8.7% of the population. This figure is lower than the national percentage of 12.3%²⁵. As income levels in Santa Ana are low and many of the elderly are living on retirement, Social Security income, or SSI, there is very likely a high degree of need for housing assistance among low-income persons with a disability.²⁶ There are approximately 1,000 individuals being served in skilled nursing facilities who may need additional assistance in case of an emergency.

PERCENT WITH DISABILITIES/SPECIAL NEEDS	
Hearing	1.80%
Vision	3.60%
Cognitive	2.50%
Ambulatory	3.40%
Self-Care	1.60%
Independent Living	2.50%
Source: ACS 2010-2014 5-Year Estimates	

²⁵ ACS 2010-2014 5-Year Estimates

²⁶ Santa Ana Consolidated Plan: <http://www.santa-ana.org/cda/documents/ConsolidatedPlan2015-2019mergedtoprint.pdf>

2.1.4.5 Homeless Population

The 2019 Orange County Point-In-Time Count and Survey identified 6,860 individuals experiencing homelessness in Orange County. With the City of Santa Ana's role as "downtown Orange County", and with many agencies located in or providing services in Santa Ana, many individuals experiencing homelessness travel to or remain in the City. The 2019 Point-in-Time Count identified 1,769 individuals in the City of Santa Ana, with 939 staying in shelters and 830 living without shelter throughout the City in various parks, public rights-of-way, and commercial areas.

2.1.5 City Government and Services

The City of Santa Ana maintains a Council-Manager form of government, which provides the legislative function and political leadership in the form of a City Council and managerial direction in the form of a City Manager. The City Council is made up of a Mayor and six Council Members, for a total of seven members. These positions are elected by Santa Ana voters, with elections held every two years. The offices of Mayor and City Council are non-partisan. The City Council hires and oversees the City Manager, City Attorney and City Clerk. The City Manager serves as a full-time chief executive and acts as the City Council's chief advisor, oversees City Staff, prepares the budget, and implements the policies and programs of the City Council.

Santa Ana is a full-service city, with most public or government services provided by the City, but it does contract or partner with other governmental agencies or private vendors for some services.

2.1.5.1 Direct City Services

Services provided directly by City departments and staff include:

- *City Manager's Office:* City management and administration, implementation of City Council policy, and public communications
- *City Attorney's Office:* Legal counsel and policy development
- *City Clerk:* Administration of elections and the legislative process, public records management
- *Community Development:* Economic development, job training, affordable housing, neighborhood initiatives and downtown development
- *Finance and Management:* Purchasing, budget and accounting, payroll, business licensing, revenue collection
- *Human Resources:* Hiring and employment services, benefits, training, risk management
- *Information Technology:* Operation of computer, network, data and telephone systems
- *Library Services:* Operate two City library facilities, including hard copy and online services.
- *Parks, Recreation and Community Services:* Operation and maintenance of parks, community centers and zoo; recreation activities, special event management, senior services
- *Planning and Building:* Land use planning, development services, code enforcement, building safety inspections and permits, and neighborhood outreach
- *Police Department:* Law enforcement and criminal investigation, traffic safety, 911 dispatch, homeland security and emergency management, animal control, and jail operations
- *Public Works:* Street construction/maintenance, storm drains/sewers; traffic and transportation management, engineering services, water supply and wastewater, refuse and recycling, and City facilities and fleet management

2.1.5.2 Private Vendor Services

The City contracts with vendors to supplement City services. These primarily include maintenance of streets, streetlights and traffic signals; solid waste (trash removal) and recycling; park and landscape maintenance; parking enforcement; security services; and information technology support.

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2.1.5.3 Services Provided by Other Government Agencies

Other government agencies provide services within the City of Santa Ana, either directly under their own authority or by contract or agreement with the City. Critical services include:

- *Orange County Fire Authority:* Firefighting, rescue, emergency medical care; hazardous materials response and regulation; fire prevention, inspections and enforcement
- *Orange County Sheriff's Department:* Law enforcement mutual aid, helicopter operations, emergency management mutual aid, and coroner services
- *CalTrans and California Highway Patrol:* Freeway operation, maintenance and traffic control
- *Orange County Transportation Authority:* Mass transit and para-transit services
- *OC Public Works and OC Flood Control District:* Flood control, engineering, and facilities
- *OC Health Care Agency:* Public and environmental health and emergency medical services
- *OC Mosquito and Vector Control District:* Tracking and abatement of disease vectors
- *OC Social Services Agency:* Child and adult protective services and benefits programs

2.1.5.4 General Economic Base

Top revenue sources for the City are sales tax, property tax, property tax in-lieu of Vehicle License Fees, utility user tax, business licenses, and hotel visitor tax. The City is home to approximately 30,000 businesses, as measured by business licenses issued, with the top 25 businesses generating approximately 25% of the jurisdiction's total sales tax revenue. The City has a solid retail base, which is anchored by the Main Place Mall, the Santa Ana Auto Mall and a thriving downtown area.

Additionally, the City's general economic base includes transportation, general retail, business-to-business, food industry, and construction. Transportation and general retail make up approximately 50% of the City's sales tax base. The top five segments for the City are restaurants, service stations, auto sales, building materials, and department stores.²⁷

The top 10 employers in the City in 2018 are²⁸:

EMPLOYER	NUMBER OF EMPLOYEES	% OF CITY EMPLOYMENT
County of Orange	19,145	12.1%
Santa Ana Unified School District	4,963	3.1%
Santa Ana College	3,433	2.2%
First American Title Company	1,815	1.1%
KPC Healthcare	1,739	1.1%
City of Santa Ana	1,454	0.9%
United States Postal Service	1,324	0.8%
Superior Court of California	760	0.5%
Johnson & Johnson	600	0.4%
Allied Universal Protection	544	0.3%

²⁷ City's 2015 CAFR, p. 5.

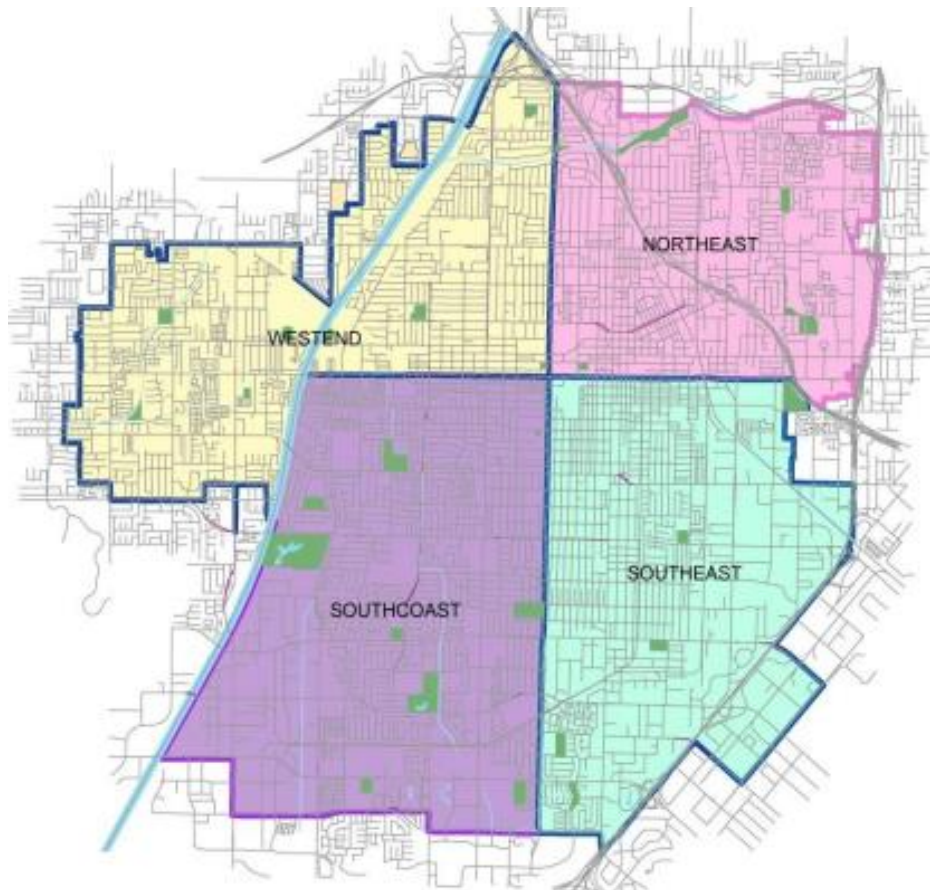
²⁸ City's 2018 CAFR, p. 228

2.1.5.5 Police Services

Santa Ana maintains its own Police Department that provides all police services, including 911 dispatch, police patrol, criminal investigations and prosecution, traffic enforcement, traffic accident investigation, parking enforcement, crime prevention, jail operations and emergency management and homeland security. For patrol purposes, the Police Department divides the City into four Patrol Districts:²⁹

- Northeast District: Serves all areas north of First Street and east of Flower Street
- Southeast District: Serves all areas south of First Street and east of Flower Street
- Southcoast District: Serves all areas south of First Street and west of Flower Street
- Westend District: Serves all areas north of First Street and west of Flower Street and the Santa Ana River

Figure 21 Police Department Geographic Districts



2.1.5.6 Santa Ana Unified School District School Police Department

SAUSD School Police Department is the primary law enforcement agency for Santa Ana Unified School District. The Santa Ana School Police Department is the third largest school police agency in California and consists of 28 sworn peace officers, 6 dispatchers, 44 civilian District Safety Officers and professional office staff.

The Department provides 24-hour a day service to over 45,000 students and 3,665 full-time, 2189 part-time and volunteer staff members at 60 schools and District locations; covering 24 of the 27 square miles within the City. School Police personnel work collaboratively with Santa Ana Police Department and other agencies to keep students and staff safe.

²⁹ <http://www.ci.santa-ana.ca.us/pd/documents/SantaAnaPoliceDepartment2014AnnualReport.pdf>

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2.1.5.7 Fire Services

Santa Ana contracts with Orange County Fire Authority (OCFA) for all fire services. This includes firefighting, emergency medical services, rescue, hazard materials response and fire and rescue mutual aid. The Fire Authority also provides development review, fire inspections, enforcement of fire safety laws, and fire prevention. OCFA Division 6 serves Santa Ana, and the Division utilizes ten fire stations in the City. These stations are well distributed at an approximate 1½-mile service radii throughout the City. However, the overlapping responsibility of fire companies allows adequate response to emergencies. The first Fire unit response goal (travel time) is less than 5 minutes. OCFA contracts with Care Ambulance Service for emergency medical transport in Santa Ana.

2.1.6 Utilities

Utilities in the City are provided by a variety of local, county, state, and private providers. Additional information on specific utilities is outlined below.

2.1.6.1 Water and Wastewater ³⁰

Domestic water services in Santa Ana are provided by the City of Santa Ana Public Works Agency Water Resources Division. The Santa Ana Water Resources Division delivers an average of 33 million gallons of water daily to some 45,000 customers. This service is provided through 21 groundwater wells, seven pumping stations, 478 miles of water mains, and 10 reservoir storage tanks with a combined capacity of 48.3 million gallons. Wells in the Santa Ana area withdraw water from between 600 to 2,700 feet below ground level.

To tap into water sources from outside the area, in 1931 the City joined with 12 other southern California cities to form and be an original member agency of the Metropolitan Water District of Southern California (MWD). MWD, as a regional wholesaler, supplies imported water to southern California from the Colorado River and from the State Water Project from Northern California. MWD's primary purpose is to develop, store and distribute water at wholesale rates to its member public agencies for domestic and municipal uses.

Santa Ana meets its water demands from a combination of groundwater and imported sources. The City pumps approximately 75 percent of its water supply from groundwater wells, and purchases 25 percent of its supply from MWD. The City's wells can provide a maximum of 74 million gallons per day (MGD), and MWD can provide up to 87 MGD. In Fiscal Year 2020-2021, the City pumped 26,081 acre-feet of water, and imported 7,738 acre-feet of water from MWD.

Approximately 395 miles of local sewer lines are maintained by the City of Santa Ana, with sewer trunks owned and maintained by the Orange County Sanitation District that provide trunk sewage collection, and sewage treatment services to the City of Santa Ana. Sewage from the City is diverted into Reclamation Plant Number 1 in the City of Fountain Valley. This plant has a capacity of over 130 MGD. The Orange County Sanitation District has indicated that the District's facilities are adequate to handle the present demand for sewage treatment. Increases in development will require the construction of additional facilities, and the District's Master Plan provides for orderly development of the necessary facilities. Sewer connection fees from new developments pay for system improvements and upgrades, as needed, in accordance with the District's Master Plan.

The Orange County Water District's Green Acres Project allows for the reuse of reclaimed wastewater for industrial and landscape irrigation uses. In 2015, approximately 4,320 acre-feet or 3.86 MGD of recycled water was used for irrigation in Fountain Valley, Santa Ana, Costa Mesa, Newport Beach and Huntington Beach. The Green Acres Project can treat and reuse as much as 7.5 MGD of wastewater.

³⁰ GP Land Use Element

2.1.6.2 Power

All electrical service to the City is provided by Southern California Edison (SCE), with the exception of electricity generated by solar systems for individual consumers. SCE operates a comprehensive system of power generating transmission facilities. Utility easements and lines are located throughout the City providing electrical service to every parcel of land in the City. Underground utility districts have been established along most major streets under Southern California Edison's Rule 20-A. The under-grounding of overhead lines is an ongoing process in the City.

SCE provided electricity consumption data in kilowatt-hours (kWh) for 2008:

- Residential 378,998,235
- Commercial/Industrial 1,398,181,157
- Total 1,777,169,392³¹

2.1.6.3 Natural Gas ³²

The Southern California Gas Company serves the entire region. An established network of gas supply and distribution lines provides natural gas service to most urban developments in the area. The Southern California Gas Company has stated that they will be able to service new development in Santa Ana without the need for expansion of existing facilities, except for properties that are currently within the pipeline network.

2.1.6.4 Communications

AT&T, Frontier (formerly Verizon), Time Warner and CenturyLink provide landline phone service and internet service in the City. Additionally, over 100 private wireless communication facilities exist in the City that are key to transmitting wireless data and information for businesses, visitors and residents in the City.

2.1.7 Transportation

Santa Ana's street and highway system is largely established and fixed, with the exception of some remaining major street improvement projects. Five freeways provide regional roadway access: The Santa Ana Freeway (I-5), the Orange Freeway (SR-57), the Garden Grove Freeway (SR-22) the Costa Mesa Freeway (SR-55), and the San Diego Freeway (I-405). The California Department of Transportation (CalTrans) estimates the Annual Average Daily Traffic (AADT) for freeway interchanges within Santa Ana, 2020 estimates are provided below.

The **Santa Ana Freeway (Interstate 5)** travels from Los Angeles County and northern California to the north to San Diego County and the U.S. Border to the south. The I-5 bisects the northeastern quadrant of the City, from the north-central 12 o'clock position to the east-central 3 o'clock position, where I-5 intersects with State Route 55. AADT for I-5 interchanges within Santa Ana at range between 301,600 and 362,000 vehicles per day and estimates peak hours at between 25,500 and 39,000 vehicles per peak hour.

The **Costa Mesa Freeway (State Route 55)** travels north to south from the 91 Freeway in the north to the City of Costa Mesa in the south and forms the eastern border for the City. The CalTrans estimates of Annual Average Daily Traffic for SR 55 at the interchanges adjacent to Santa Ana are between 167,000 and 280,000 vehicles per day and 14,000 and 21,800 per peak hour.

The **San Diego Freeway (Interstate 405)** travels north to south from Los Angeles County in the north to its endpoint at the I-5 Freeway in southern Orange County. Near Santa Ana, the I-405 travels in a more east to west direction and forms an approximate southern border for the City, although it is several blocks south of the actual border. CalTrans estimates the annual average daily traffic for I-405 at the interchanges adjacent to Santa Ana at between 186,200 and 285,000 vehicles per day and between 14,000 and 22,000 per peak hour.

³¹ Santa Ana Climate Action Plan; http://www.santa-ana.org/climateactionplan/documents/climate_action_plan.pdf

³² GP Land Use Element

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The **Garden Grove Freeway (State Route 22)** travels east to west from the City of Orange northeast of Santa Ana to the City of Long Beach northwest of the Santa Ana. SR-22 forms the northern border for the City in the northeast and is several blocks north of the City border in the northwest. CalTrans estimates the annual average daily traffic for SR 55 at the interchanges adjacent to Santa Ana at between 162,400 and 233,800 vehicles per day and between 12,500 and 17,700 per peak hour.

The **Orange Freeway (State Route 57)** is a north to south freeway with its southern endpoint at the northern border of the City, at the intersection of the I-5 and SR 22 Freeways, where the annual average daily traffic volume is between 98,000 and 181,000 vehicles per day and between 8,600 and 15,900 per peak hour.

Other significant freeways within Orange County include **State Routes 90 and 91** in the north/northeast portion of the County and the **133 and 241 Toll Roads** serving southern portions of the County. All CalTrans freeways in Orange County are serviced by CalTrans District 12, which is headquartered in the City of Santa Ana at 1750 East 4th Street.

The city has an established Master Plan of Streets and Highways, and each roadway is assigned to one of the following classifications³³:

Principal Arterial: Typically, an eight-lane, divided roadway designed to accommodate between 45,000 to 67,500 vehicle trips daily. The typical right of way width is 144 feet. The section of **Dyer Road** that lies east of SR 55 is the principal arterial in the City.

Major Arterial: Generally consists of six-travel lanes, and is also divided. Typically, the right-of-way width for this type of roadway is 120 feet. A major arterial is designed to accommodate between 33,900 and 50,600 vehicle trips daily. Major arterials in Santa Ana include:

STREET	FROM*	TO*
(Upper) Harbor Boulevard	NCL	SCL
(Lower) Harbor Boulevard	NCL	SCL
17th Street	Fairview Street	ECL
1st Street	WCL	ECL
4th Street	Mabury Street	ECL
Bristol Street	22 Freeway	SCL
Dyer Road	Flower Street	Grand Avenue
Edinger	WCL	ECL
Euclid Street	NCL	SCL
Fairview Street	NCL	SCL
Grand Avenue	NCL	Dyer Rd.
Lawson Way	Memory Lane	NCL
MacArthur Boulevard	WCL	ECL
Main Street	NCL	17th Street
Main Street	Warner Avenue	SCL
Memory Ln.	Main Street	Parker Street
Santa Ana Boulevard	Raitt Street	Ross Street
Segerstrom Avenue	Harbor Boulevard	Flower Street
Sunflower Avenue	Bear Street	Main Street
Tustin Avenue	1st Street	NCL
Warner Avenue	WCL	ECL
Westminster Avenue	WCL	ECL
*NCL=Northern City Line, SCL=Southern City Line, ECL=Eastern City Line, WCL=Western City Line		

³³ GP Circulation Element

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Primary Arterial: Generally consists of a four-lane, divided roadway. Typically, the right-of-way width is 100 feet. A primary arterial is designed to accommodate between 22,500 and 33,800 vehicle trips daily. Primary arterials in Santa Ana include:

STREET	FROM	TO
4th Street	Breeden Street	Mabury Street
Alton Avenue	Main Street	Standard Avenue
Alton Parkway	Daimler Street	Red Hill Avenue
Chestnut Avenue	Grand Avenue	ECL
Columbine Avenue	Main Street	Halladay Street
Flower Street	Warner Avenue	Sunflower Avenue
Mabury	Fruit Street	Parkcourt Pl.
Main Street	Edinger Avenue	Warner Avenue
McFadden	WCL	Grand Avenue
Memory Ln.	Santa Ana River	Bristol Street
Parkcourt Pl.	Mabury	Cabrillo Park Dr.
Santa Ana Boulevard	Ross Street	Grand Avenue
NCL=Northern City Line, SCL=Southern City Line, ECL=Eastern City Line, WCL=Western City Line		

Secondary Arterial: Generally a four-lane, undivided roadway. The typical right-of-way width for this category of roadway is 80 feet. A secondary arterial is typically designed to accommodate between 15,000 and 22,500 vehicle trips daily. Secondary arterials in Santa Ana include:

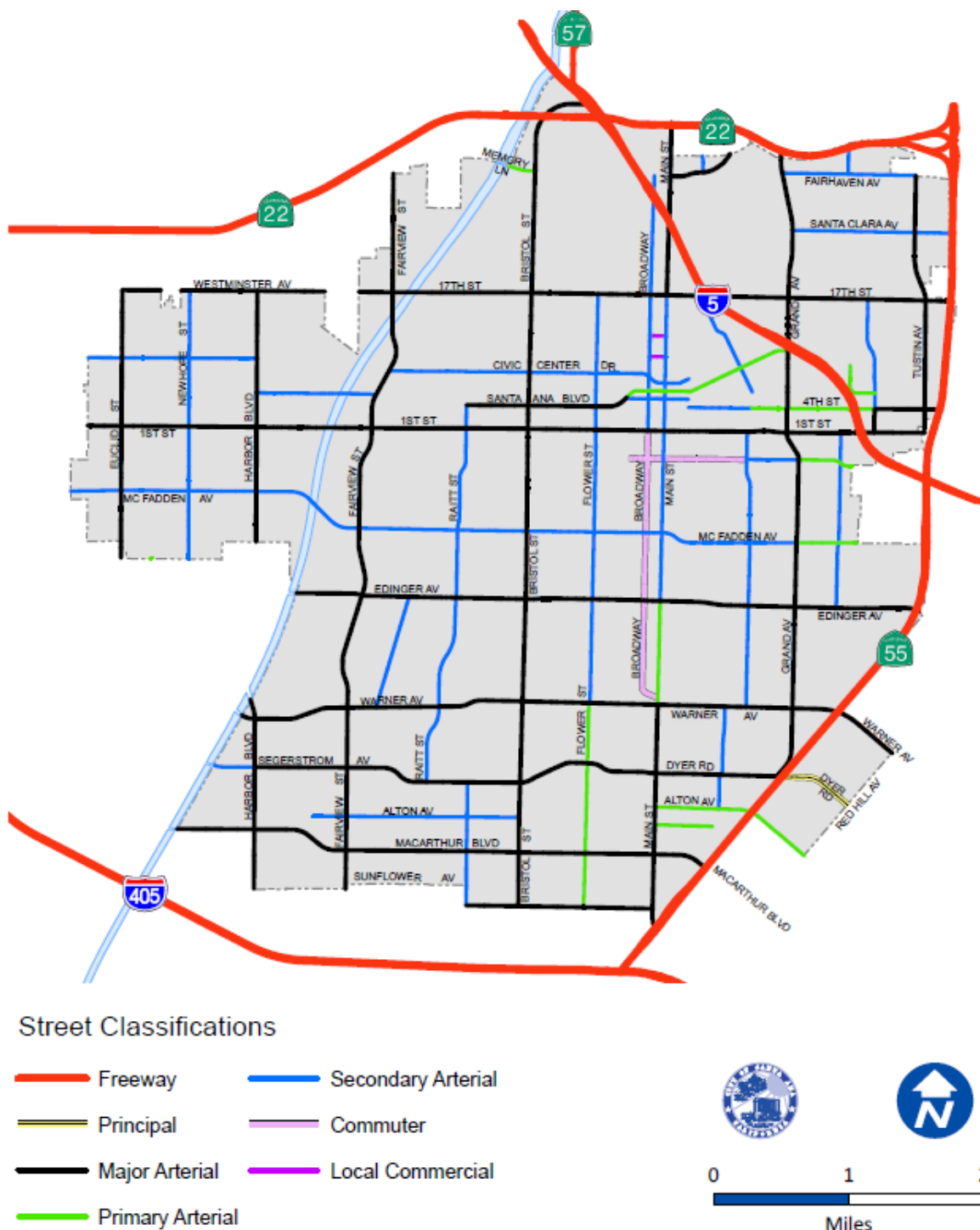
STREET	FROM	TO
4th Street	French Street	Breeden Street
5th Street	Harbor Boulevard	Fairview Street
5th Street	Fairview Street	Sullivan Street
5th Street	Ross Street	Minter Street
Alton Avenue	Susan Street	Bristol Street
Bear Street	Seegerstrom Avenue	Sunflower Avenue
Broadway	I-5 Freeway	1st Street
Cambridge Street	22 Freeway	Fairhaven Avenue
Chestnut Avenue	Standard Avenue	Grand Avenue
Civic Center Dr.	Fairview Street	Spurgeon
Fairhaven Avenue	Grand Avenue	Tustin Avenue
Flower Street	17th Street	Warner Avenue
Greenville Street	Edinger Avenue	Warner Avenue
Halladay Street	Warner Avenue	Alton Avenue
Hazard Avenue	WCL	Harbor Boulevard
Lyon Street	1st Street	Edinger Av
Main Street	17th Street	Edinger Avenue
McFadden	Grand Avenue	ECL
Newhope Street	NCL	SCL
Raitt Street	Santa Ana Boulevard	Seegerstrom Avenue
Santa Clara Avenue	Grand Avenue	ECL
Seegerstrom Avenue	WCL	Harbor Boulevard
Standard Avenue	1st Street	Warner Avenue
NCL=Northern City Line, SCL=Southern City Line, ECL=Eastern City Line, WCL=Western City Line		

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Commuter Street: A two-lane, undivided roadway carrying less than 10,000 vehicle trips per day. The right-of-way width for this roadway classification is 60 feet. Collectors are also two-lane undivided roadways with a right-of-way width of 56 feet.

Local Commercial Street: A two-lane, undivided roadway carrying up to 6,000 vehicle trips per day. Parking may be allowed on both sides of the street, businesses are located on both sides of the street. The right-of-way width for this roadway classification is 60 feet.

Figure 26 Master Plan of Street and Highways



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Mass Transit - Santa Ana has a multi-modal circulation system that includes both private and public transportation and rail service. The Orange County Transportation Authority (OCTA) operates bus routes over numerous city streets, including rapid transit bus lines along 17th Street, Bristol Street, and Harbor Boulevard.³⁴

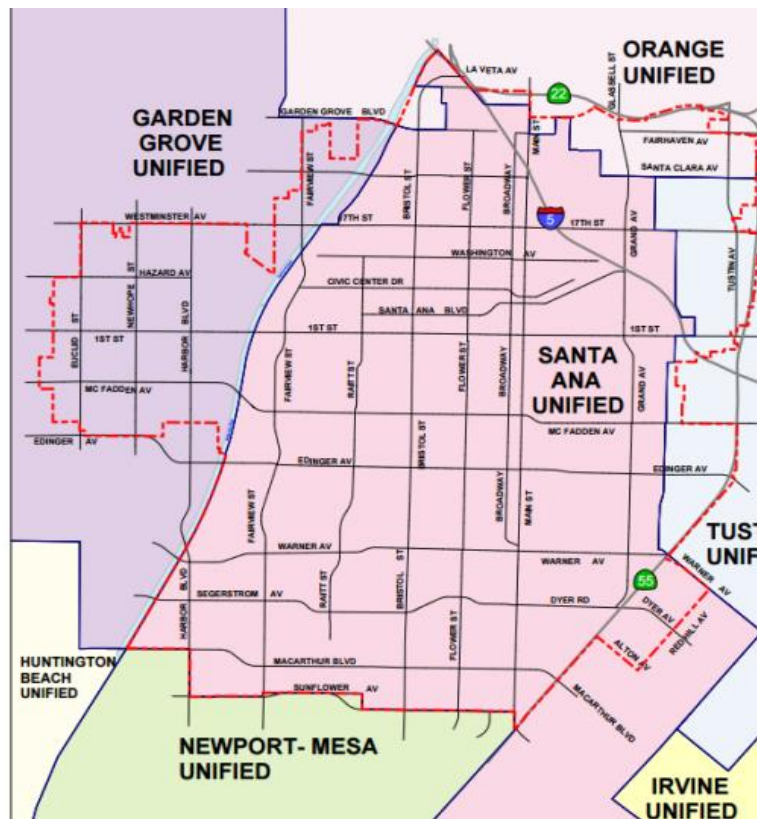
The Santa Ana Regional Transportation Center (SARTC), at 1000 East Santa Ana Boulevard, is a focal point for transportation in Orange County, combining Amtrak and Metrolink passenger rail, Orange County Transportation Authority transit, and Greyhound intercity and interstate bus transportation, and other private bus and shuttle services. Specifically, the Amtrak Pacific Surfliner stops at SARTC with 25 daily trains; as of 2019, the train route has seen on average approximately 264 boardings/alightings per day and 96,360 passenger boardings/alightings per year. Metrolink stops at SARTC with approximately 36 daily trains, split about evenly between trains traveling north to the Los Angeles area and trains east to the Inland Empire, and with approximately 853 passenger boardings/alightings per day and 311,45 boardings/alightings per year. Greyhound has approximately 20 bus trips per day at SARTC with approximately 46,925 passengers per year. The Orange County Transportation Authority provides 384 bus stops at the Santa Ana Regional Transportation Center.

In conjunction with OCTA and the Federal Department of Transportation, the City is engaged in construction of a 4.1 mile Orange County Streetcar route connecting the Santa Ana Regional Transportation Center (SARTC) with the City of Garden Grove at Westminster Avenue and Harbor Boulevard.

2.1.8 Schools

The City is served by four public school districts: Santa Ana Unified School District (SAUSD), Garden Grove Unified, Tustin Unified and Orange Unified. Public education in the City is provided primarily by SAUSD, which school district boundaries include the majority of City of Santa Ana east of the Santa Ana River.³⁵ See Appendix for a list of all schools in the City.

Figure 27 School District Boundaries



³⁴ Circulation Element; OCTA

³⁵ Info + Stats from OC Department of Education 2015-2016 Public Schools Directory

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Santa Ana Unified School District (SAUSD)³⁶: SAUSD has 60 schools total, which are all located in Santa Ana and includes 37 elementary schools, 8 intermediate schools, 6 high schools, 4 alternative high schools, and several charter schools and educational centers. SAUSD is the seventh largest school district in California and the largest in Orange County, serving approximately 45,000 students. The District Offices are located on East Chestnut Avenue.

Garden Grove Unified School District (GGUSD)³⁷: GGUSD has 66 schools total, with five elementary schools and one intermediate school in Santa Ana. GGUSD is the third largest school district in Orange County and serves approximately 43,000 students.

Orange Unified School District (OUSD)³⁸: OUSD has 42 schools total, including one elementary school in Santa Ana.

Tustin Unified School District (TUSD)³⁹: TUSD has 30 schools total. There are no TUSD schools within the City of Santa Ana's borders, but a small number of Santa Ana residents attend TUSD schools.

The City has approximately 15 private schools, including Mater Dei and Calvary Chapel High Schools.

Rancho Santiago Community College District (RSCCD): RSCCD has four facilities in Santa Ana. Santa Ana College occupies 63 acres at the intersection of Bristol and West 17th Street and has a daytime population of approximately 13,000 students and faculty. Centennial Education Center in Centennial Park has a daytime population of approximately 1600 students and faculty. The Digital Media Center on Bristol Street has an approximate daytime population of 200 students and faculty. The District Offices are located on North Broadway and have a staff population of approximately 150. The District does not contain any dormitory or overnight populations.

2.1.9 Community and Neighborhood Associations

There are approximately 100 homeowner associations (HOAs) in Santa Ana. HOAs are separate legal entities but provide to their residents public services similar to those provided by the government, generally by a property management firm contracted to the HOA.

Santa Ana has 64 Neighborhood Associations throughout the City. These Neighborhood Associations are voluntary organizations formed to help improve neighborhood quality of life, promote sense of community, and provide a venue for residents to get involved and make a difference in their respective neighborhoods.⁴⁰

In addition, the Communication Linkages Forum (Com-Link) further serves to represent the leaders of Santa Ana's diverse neighborhoods and is comprised of a seven-member Board of Directors elected by the leadership of the neighborhoods. Com-Link's work is ongoing and typically addresses issues of citywide interest, i.e. public policy in the areas of safety, development, finance and community standards. The group has monthly general membership meetings that are open to the public. Neighborhood Associations and Com-Link are managed by the Neighborhood Initiatives program within the Planning Division of the Santa Ana Planning and Building Agency.

³⁶ <http://www.sausd.us/domain/3>

³⁷ http://www.ggusd.us/docs/GGUSD-FactMap_2015-16_Rev_10-15.pdf

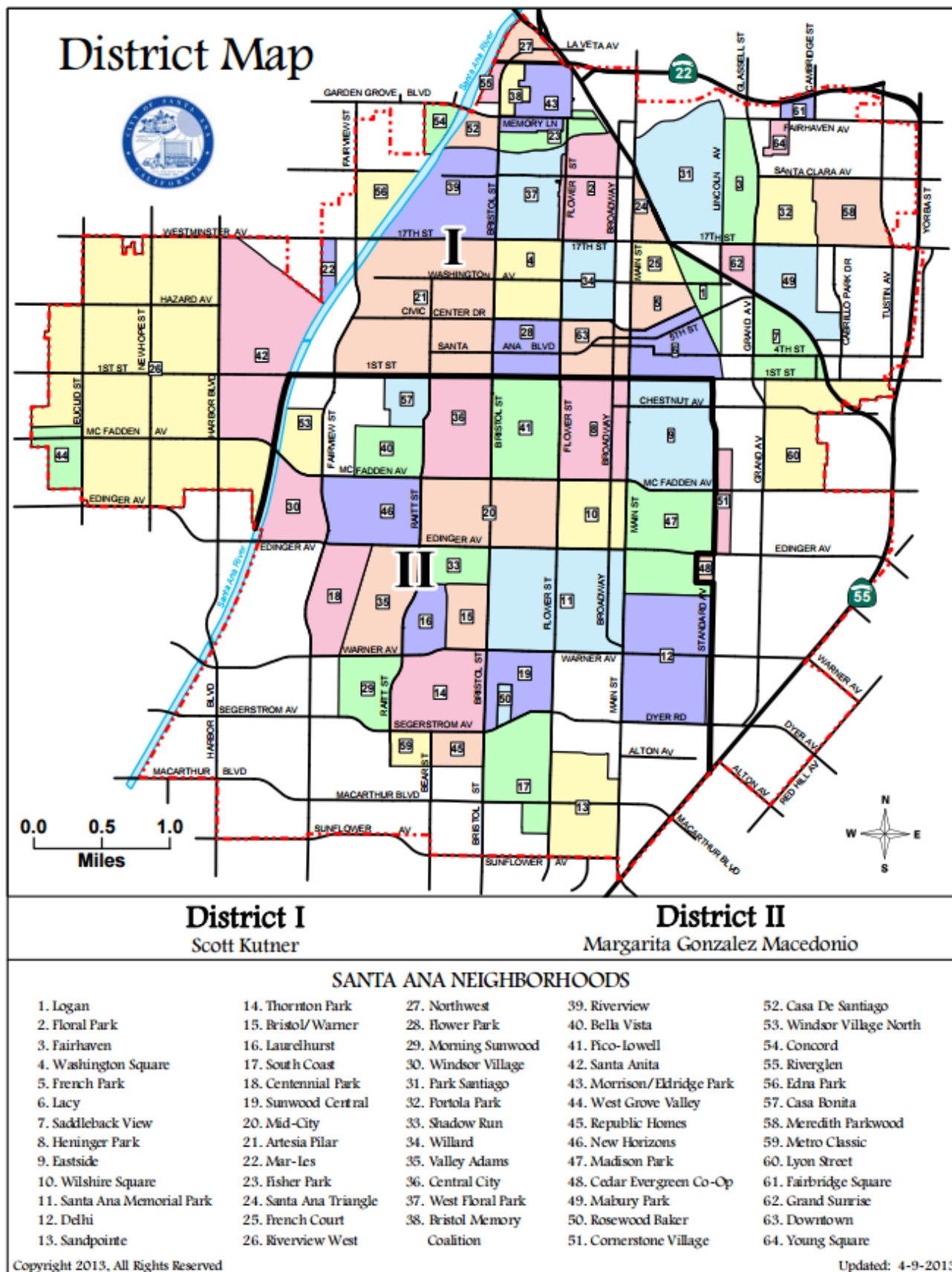
³⁸ <http://www.orangeusd.k12.ca.us/schools/index.asp>

³⁹ <http://www.tustin.k12.ca.us/cms/lib02/CA01001904/Centricity/Domain/69/District%20%20Map%20-%20Rev%208-29-16.pdf>

⁴⁰ <http://www.ci.santa-ana.ca.us/cda/NeighborhoodMeetings.asp>

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Figure 29 Neighborhood Association Boundaries



2.2 Critical Infrastructure and Critical Facilities

The US Department of Homeland Security (USDHS) defines Critical Infrastructure as assets, systems and networks so vital that their incapacitation or destruction would have a debilitating effect on the security, economy or public health and safety of the nation. Critical infrastructure may be publicly or privately owned. USDHS identifies 16 Critical Infrastructure Sectors:

- Chemicals
- Commercial Facilities
- Communications
- Critical Manufacturing
- Dams
- Defense Industrial Base
- Emergency Services
- Energy
- Financial Services
- Food and Agriculture
- Government Facilities
- Healthcare and Public Health
- Information Technology
- Nuclear Materials and Waste
- Transportation
- Water and Wastewater

The USDHS definition of critical infrastructure focuses on prevention and protection from terrorism or intentional acts. The Community Profile information detailed in Section 2.1 above provides a description of the primary critical infrastructure for the City of Santa Ana, which focuses on the assets and resources necessary for City operations and functioning on a day-to-day basis or for disaster response and recovery.

A subset of Critical Infrastructure is Critical Facilities. Critical facilities are defined in this Plan as a specific building, structure or property (public or private) which is vital to the City's ability to provide essential services and to protect life and property, especially during a hazard or disaster event. This Plan identifies seven categories of critical facilities for the City:

- Government (city, county, state, and federal offices, police and fire stations, military)
- Schools and Colleges
- Utilities (electric, gas, water/wastewater, and communications sites)
- Transportation (mass transit and transportation maintenance facilities)
- Healthcare (hospital, ambulance and public health facilities)
- Mass Care or Disaster Relief (shelters, points of distribution, disaster relief NGO's)
- Critical Retail (grocery, pharmacy and home repair/hardware stores affiliated with regional or national, disaster-resilient management and distribution networks)

Most critical facilities within the City of Santa Ana are known or accessible to the public, some facilities have requested to keep their actual location or role in emergency response private. Identification of critical facilities is protected from disclosure by the official information privilege. Official information includes information, the disclosure of which is against the public interest, due to necessity for preserving the confidentiality of the information that outweighs the necessity for disclosure in the interest of justice. The City of Santa Ana Planning and Building Agency, Business License Division can provide an updated list of private-sector facilities, and individual government agencies can update their listed facilities.

2.3 Hazard Analysis Process and Rankings

Hazard analysis provides information on the hazards that are reasonably likely to occur in or affect the City of Santa Ana; an assessment of the risk to life, property and the environment that may result from the hazard event; and potential locations within or around the City that may be susceptible to the event.

Hazard analysis is dependent on the availability of data for each hazard. Analysis is based on the record of historical events as well as future projections, and data is drawn from such disciplines as geography and geology, climate and weather, population and demographics, infrastructure and development, and homeland security. Gathering data for hazard analysis requires a commitment of resources from multiple City departments and relevant outside agencies.

Santa Ana's Hazard Analysis is prepared through discussion among representatives from emergency management, police, fire, public works and engineering, planning and development services, City administration and outside resources.

Santa Ana's hazard analysis consists of a three-step process:

1. List all natural, technological or human-caused hazards that may reasonable, foreseeably harm the City.
2. Score each identified hazard on the following criteria and points:
 - Frequency of Occurrence
 - Rare or Unlikely 1
 - Occasional 2
 - Common 3
 - Geographic Extent
 - One or Few Locations 1
 - Citywide Impact 2
 - County/State/National Impacts 3
 - Harm to Persons (Injuries or Deaths)
 - Little or No Physical Injury 1
 - EMS/Hospitals/Coroners Strained 2
 - EMS/Hospitals/Coroners Overwhelmed 3
 - Damage to Property or Infrastructure
 - Little or No Physical Damage 1
 - Hours or Days of Cleanup or Repairs 2
 - Weeks or Months of Cleanup or Repairs 3
 - Warning Time Received
 - Days or Hours 1
 - Minutes 2
 - None 3
3. Total the points scored for each hazard, resulting in a numerical ranking of all hazards.

This numerical ranking is not a mathematical certainty, but instead is a guide for prioritizing planning efforts, preparedness resources and community education.

This hazard analysis indicates that the City is at risk from a variety of natural, technological and human-caused hazards, with the potential to cause disasters exceeding any one jurisdiction's capabilities to successfully respond and manage the event, making coordinated command and control and the support of outside resources essential.

The current Hazard Analysis ranking for the City of Santa Ana appears below:

Figure 32 Hazard Ranking for the City of Santa Ana

Hazard	Frequency: 1. Rare/Unlikely 2. Occasional 3. Common	Geographic Extent: 1. One/Few Locations 2. Citywide 3. Regional/National	Injuries/Deaths: 1. Little or None 2. Multiple 3. Overwhelming	Physical Damages: 1. Little or None 2. Hours/Days Repair 3. Weeks/Months Repair	Warning Time: 1. Days or Hours 2. Minutes 3. No Warning	Hazard Score: Total Points
Earthquake	1	3	3	3	3	13
Weapon of Mass Destruction	1	2	3	3	3	12
Extreme Temperature	3	3	2	1	1	10
Power Failure	2	3	1	2	2	10
Storm/Flood	2	3	1	3	1	10
Dam/Reservoir Failure	1	3	1	3	2	10
Communications Failure	1	3	1	2	3	10
Civil Unrest	3	2	1	2	1	9
Targeted Act of Violence	1	1	2	2	3	9
Disease Outbreak/Pandemic	1	3	3	1	1	9
Aircraft Crash	1	1	2	2	3	9
Railroad Crash/Derailment	1	1	2	2	3	9
Drought/Water Failure	2	3	1	1	1	8
Hazardous Materials	1	1	1	2	3	8
Urban Conflagration	1	1	1	2	2	7

2.4 Hazard Threat Assessments

Hazard threat assessments provide a description of each of the hazards that potentially threaten the City of Santa Ana. Assessments include the characteristics or effects of each hazard, the causes or sources of the hazard, past history and future projections of the occurrence of the hazard in this area, and potential losses or impacts to the City from the hazard.

Each hazard threat assessment is developed from city, county, state or federal resources, including existing emergency operations and hazard mitigation plans, as well as published academic or scientific research. Hazard threat assessments represent an overview of knowledge of the hazard, but are subject to the availability of data for each hazard.

2.4.1 Earthquake

Earthquakes are considered a major threat to the City of Santa Ana due to the proximity of several major fault zones, notably including the San Andreas and the Newport-Inglewood Faults. A significant earthquake along a major fault could cause substantial casualties; extensive damage to buildings, roads and bridges; fires and gas leaks; and other threats to life and property. These effects could be aggravated by aftershocks and by secondary effects such as loss of water supply, power outages, hazardous materials spills or dam failure. A major earthquake could be catastrophic in its effect on the population, and could exceed the capabilities of the City, surrounding communities, Orange County, and even the State to respond. Extensive federal assistance could be required and could remain necessary for an extended period of time.

Following major earthquakes, extensive search and rescue operations may be required to assist trapped or injured persons. Emergency medical care, food and temporary shelter would be required for injured or displaced persons. Efforts would be required to remove debris and clear roadways; to demolish unsafe structures; and to assist in reestablishing public services and utilities. In the event of a truly catastrophic earthquake, identification and removal of the deceased may pose a problem. Emergency operations could be seriously hampered by the loss of communications and damage to transportation routes within, to and out of the disaster area and by the disruption of public utilities and services.

Some evacuations may be necessary from specific hazards (dam failures or hazardous materials spills), and some residents may self-evacuate if homes are damaged, utilities are out or critical resources (food, groceries, medical care) are unavailable, but large-scale or mass evacuation would be unlikely, especially if transportation routes are damaged or unsafe. Many families could be separated, particularly if the earthquake occurs during work and school hours, and continuing mass care and shelter for affected populations may be required for an extended time.

In general, the population is less at risk during non-work hours as wood-frame homes are relatively less vulnerable to major structural damage than many commercial and industrial buildings. Transportation problems are intensified if an earthquake occurs during work hours, as significant numbers of residents commute for work or school to and from neighboring cities and counties. An earthquake occurring during work and school hours would create major transportation problems for those displaced persons.

Hazardous materials spills could present a major problem in an earthquake. Orange County, one of the largest industrial and manufacturing areas in the state, has several thousand firms that handle hazardous materials, with several hundred firms handling materials rated as extremely hazardous and several dozen handling threatening levels of radioactive materials. These businesses are estimated to produce more than 100 million gallons of hazardous waste per year. City freeways, roadways and railways serve as hazardous materials transportation corridors, and Interstate 5 is the third busiest freeway corridor in the country.

The City of Santa Ana represents not only the seat of government for Orange County, but also a transportation hub and primary location for business and industry in the county. The economic impact of a major earthquake on the City would be considerable in terms of the losses to the employment and tax base, affecting the ability of residents, businesses and government to make purchases and payments.

History of Earthquake Events in Southern California

Historical and geological records show that California has a long history of seismic events. The earliest recorded earthquake in California occurred in Orange County in 1769 on the San Joaquin Hills Fault. Southern California is probably best known for the San Andreas Fault, a fault running from near the Mexican border to a point offshore, north of the San Francisco Bay Area. Geologic studies show that over the past 1,500 years large earthquakes have occurred at about 140-150 year intervals on the Southern San Andreas Fault. As the last large earthquake on the Southern San Andreas occurred in 1857 (more than 160 years ago), that section of the fault is considered a likely location for an earthquake within the next few decades, according to www.data.scec.org/.

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Yet the San Andreas is only one of numerous known active faults that crisscross Southern California. A fault is considered active if it has ruptured within the last 11,000 years and potentially active if it has ruptured in the last 1.8 million years. Large faults that would affect the Orange County area include the San Andreas, Newport-Inglewood, Los Alamitos, Whittier, Elsinore, Chino and San Jacinto Faults. Smaller Orange County-area faults include the Norwalk Fault, the El Modena and Peralta Hills Faults, as well as the newly studied San Joaquin Hills and Puente Hills Faults. Beyond these known faults, there are potentially a number of “blind” faults, faults that have not yet been discovered or mapped, underlying the surface of Southern California. The Whittier Narrows Earthquake in October 1987 and the Northridge Earthquake in January 1994 occurred on blind faults.

Figure 34 Orange County Earthquake Fault Zones



Notes on Figure 34: The fault touching the right margin of the map is the Elsinore Fault but is incorrectly labeled the Whittier Fault. The Whittier Fault lies at the top center where it is correctly labeled. The San Joaquin Hills Fault does not appear on this map but runs along the 405 Freeway south of the City border.

Although the most famous of the faults, the San Andreas, is capable of producing an earthquake with a magnitude of 8.0 or more on the Richter scale, some of the “lesser” faults have the potential to inflict greater damage on the urban core of Orange County. Seismologists believe that a 6.0 earthquake on the Newport-Inglewood would result

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in far more death and destruction than a great quake on the San Andreas, because the San Andreas is relatively remote from the urban centers of Southern California.

Since seismologists started recording and measuring earthquakes, there have been tens of thousands of recorded earthquakes in Southern California, most with a magnitude below three. In the last 100 years, southern California has experienced over 220 earthquakes of Magnitude 5.0 or larger. No community in Southern California is beyond the reach of a damaging earthquake. The chart below describes notable historical earthquakes that have affected Southern California.

Southern California Region Earthquakes with a Magnitude 5.0 or Greater				
Year	Earthquake	Fault(s) (if known or named)	Magnitude	Deaths
1769	Los Angeles Basin	San Joaquin Hills	Est. 5.5+	
1800	San Diego Region		Est. 6.5+	
1812	Wrightwood	San Andreas	Est. 7.5+	40
1812	Santa Barbara Channel		7.1	
1857	Great Fort Tejon	San Andreas	7.9	2
1858	San Bernardino Region		Est. 5.5+	
1862	San Diego Region		Est. 5.5+	
1892	San Jacinto or Elsinore		Est. 6.5+	
1899	Cajon Pass		5.7	
1899	San Jacinto and Hemet	San Jacinto	6.5	6
1910	Glen Ivy Hot Springs	Elsinore	6.0	
1918	San Jacinto and Hemet	San Jacinto	6.8	1
1923	San Bernardino Region	San Jacinto	6.3	
1925	Santa Barbara		6.3	13
1933	Great Long Beach	Newport-Inglewood	6.4	120
1937	San Jacinto	San Jacinto	6.0	
1948	Desert Hot Springs	Banning/South Branch San Andreas	6.0	
1952	Kern County	White Wolf	7.5	12
1954	San Jacinto	Clark	6.4	
1971	San Fernando-Sylmar	San Fernando	6.6	65
1987	Whittier Narrows	Puente Hills	5.9	8
1992	Landers	Multiple faults	7.3	1
1992	Big Bear		6.4	
1994	Northridge	Northridge	6.7	57
1999	Hector Mine	Lavic Lake and Bullion Faults	7.1	
2003	San Simeon		6.5	2
2008	Chino Hills	Chino	5.4	
2010	Baja California-Sierra Mayor	Multiple faults	7.2	2
2014	La Habra		5.1	
2019	Ridgecrest	Eastern California Shear Zone	6.4 and 7.1	
Source: SCEC, USGS websites				

The most recent significantly damaging earthquake affecting Southern California was the 1994 Northridge Earthquake. At 4:31 A.M. on Monday, January 17, a moderate-strength but very damaging earthquake with a magnitude of 6.7 struck the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures. Fifty-seven people were killed and more than 1,500 people seriously injured.

For days, thousands of homes and businesses were without electricity, tens of thousands had no gas, and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left

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thousands of people temporarily homeless. Of the 66,500 buildings inspected, nearly 4,000 were severely damaged and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but earthquake-triggered liquefaction and dozens of fires caused additional severe damage. This extremely strong ground motion felt in large portions of Los Angeles County, and in Orange County as well, resulted in record economic losses including direct and indirect economic losses of approximately \$46 billion.

Even so, this earthquake occurred in the very early morning hours of a national holiday. Many collapsed buildings were unoccupied, schools and most businesses were not yet open and freeways were sparsely traveled. This factor considerably reduced the impacts of this earthquake.

Earthquake Hazards

Ground shaking, ground failure and tsunami are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking - Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage, producing 98% of structural and nonstructural (contents) damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter where the earthquake originates. Additionally, buildings constructed on loose, poorly consolidated or soft soils will typically see more damage than buildings on consolidated soils and bedrock. In some cases, ground shaking and the associated damage may actually be more severe in places farther from the fault than nearer locations, due to differences in soil consistency and amplification of the seismic waves as they travel through the earth. This was the case with the 1989 Loma Prieta Earthquake, whose epicenter was in the Santa Cruz Mountains but some of the most severe shaking and damage occurred about 60 miles to the north in the San Francisco Bay Area.

Ground Failure - Ground failures can include surface rupture, liquefaction and landslides.

Surface Rupture - The sliding movement of the earth on either side of a fault is called fault rupture. Fault rupture begins below the earth's surface but in a powerful enough earthquake, may actually travel all the way to the ground surface, creating a visible crack or separation of the ground surface. This can result in massive damage to any structures built above the rupture, as well as significant damage to roadways, utility lines or other structures located on the rupture. With no known active faults in the City of Santa Ana, the risk of surface rupture occurring in the City of Santa Ana is believed to be minimal.

Liquefaction - Liquefaction occurs when soft, loose or water-saturated soil settles suddenly during earthquake shaking. The soil converts to a fluid-like substance, causing it to lose the strength to support the weight of buildings or other structures, and these structures will sink or topple over. Many communities in Southern California, including portions of Santa Ana, are built on floodplains or ancient river or lake bottoms and have loose, sandy soil. The Figure below shows the areas of Orange County that may be susceptible to liquefaction. See also the California Geological Survey website at http://gmw.consrv.ca.gov/shmp/html/pdf_maps_so.html, where the California Geological Survey has identified areas most vulnerable to liquefaction.

Figure 37 Liquefaction Map, Orange County

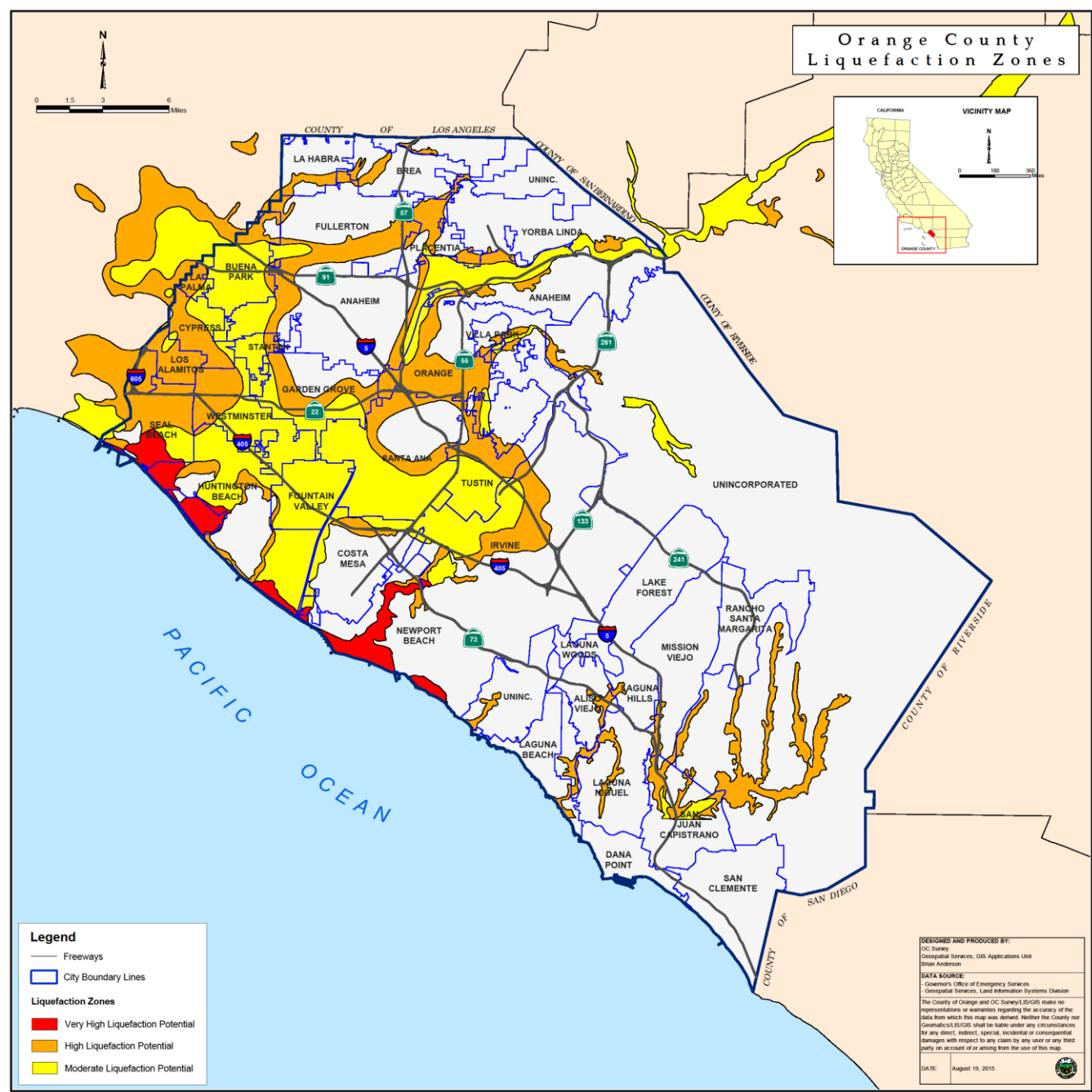


Figure 38 Liquefaction Damage Kobe, Japan Earthquake, 1995



Landslides - Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy roads, buildings, utilities and other critical facilities necessary to respond to and recover from an earthquake. Orange County has many active landslide areas, and a large earthquake could trigger accelerated movement in these slide areas, in addition to jarring loose other unknown areas of landslide risk. The City of Santa Ana is primarily flat and not susceptible to landslide, with the exception of a few small areas along the Santiago Creek in the north of the City. However, landslides in other communities may disrupt utility, communications or transportation infrastructure critical to the City's needs.

Tsunami and Seiche

A tsunami is a powerful ocean wave caused by a seismic event that raises or lowers the sea floor, shifting a massive volume of seawater and causing a series of large or massive waves to sweep ashore. The City of Santa Ana is far enough from the coast that tsunami is not a threat. However, Orange County coastal cities are potentially at risk from tsunami, which could result in an influx of evacuees and traffic into the City. A seiche is a series of large waves, generated by seismic shaking, on an enclosed body of water such as a lake, pond, reservoir or large swimming pool, numerous of which exist in Santa Ana. Seiches may result in significant side-to-side sloshing of water, resulting in displacement of water onto the ground surface and causing localized flooding, damage to nearby structures, or damage to the structure of the lake, reservoir or pool.

Earthquake Susceptibility and Damages

The effects of earthquakes span a large area, and large earthquakes occurring in many parts of Southern California would probably be felt throughout Orange County. However, the degree to which the earthquakes are felt and the damages associated with them may vary. Earthquake damage occurs where humans have built structures that cannot withstand severe shaking. Homes, businesses, schools and lifelines (roadways and utility lines) suffer damage in earthquakes and cause death or injury to people. At risk from earthquake damage are large stocks of old buildings and bridges; high tech and hazardous materials facilities; extensive sewer, water, and natural gas pipelines; dams and reservoirs; fuel tanks and pipelines; and other critical facilities and private property. Addressing the reliability of buildings, critical facilities and infrastructure, and understanding the potential costs to government, businesses, and residents as a result of an earthquake, are challenges facing the City.

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Death and Injury - Death and injury can occur both inside and outside of buildings due to collapsed buildings and falling equipment, furniture, debris, and structural materials. Downed power lines and broken water and gas lines can also endanger human life. Damage to transportation infrastructure or debris on roadways may result in multiple vehicle crashes.

Fire - Downed power lines and broken gas mains can trigger fires. When fire stations suffer building or utility damage, quick response to extinguish fires is less likely. Major incidents will demand a larger share of resources, and initially smaller fires and problems will receive little or insufficient resources in the initial hours after a major earthquake event. Loss of electricity and broken water mains may cause a loss of water pressure, further hampering firefighting ability.

Buildings - The built environment, comprised of buildings, various vertical or horizontal structures used or occupied, and supporting infrastructure, is susceptible to damage from earthquakes. At best, these structures were built to remain upright during shaking long enough to afford occupants time to vacate once it is safe to do so. At worst, buildings can collapse, trapping or burying people. Many lives may be at risk and the cost to repair the damage can be great.

Santa Ana is one of the original communities in Orange County and has a substantial number of buildings built before 1933 (the year of the Long Beach Earthquake) and before 1994 (the year of the Northridge Earthquake), which may be susceptible to major earthquake damage. These were pivotal years as they marked the origination and improvement of seismic safety standards that are enforced today. In the late 1970's, the City performed a survey to tag and mitigate hazards posed by the most dangerous type of structure, unreinforced masonry (URM) buildings. 209 buildings were tagged and were either seismically retrofitted to afford occupants more time to vacate, or were demolished. Many of these structures are concentrated in the downtown area. With the older construction existing in the City, a significant number of structures remain at risk, including concrete tilt-up buildings, homes on raised foundations, soft-story structures and pre-1970 non-ductile multi-story concrete structures. Robust application of current building codes and proper inspection of buildings is vitally necessary to protect against loss of life and property.

Infrastructure and Communication – These lifelines are the connections between communities and outside services. They include water and gas lines, transportation systems, electricity, and communication networks. Ground shaking and ground failure can cause pipes to break open, power lines to fall, roads and railways to crack or move, and radio and telephone communication to fail. Disruption to transportation makes it especially difficult to bring in emergency supplies or services. Lifelines need to be usable after earthquakes to allow for rescue, recovery, and rebuilding efforts; to relay important information to the public; and to restore businesses and commerce.

Residents commute frequently by automobile and public transportation such as buses and rail. An earthquake can damage bridges and roads, hampering the normal movement of people and goods and preventing emergency response efforts. Damaged infrastructure strongly affects the economy of the community because it disconnects people from work, school, food and family, and separates businesses from their customers and suppliers.

Bridge or Overpass Damage - Even modern bridges can sustain damage during earthquakes, leaving them unsafe for use. Some may fail completely due to strong ground motion. Bridges are a vital transportation link as even minor damages can make some areas inaccessible. Because bridges vary in size, materials, location and design, any given earthquake will affect them differently. Bridges built in the 1970's or before have a significantly higher risk of suffering structural damage during a moderate to large earthquake compared with those built after 1980 when design improvements were made.

Much of the interstate highway system was built in the mid to late 1960's. The bridges in Orange County are state, county or privately owned (including railroad bridges). Cal Trans has retrofitted most bridges on the freeway systems; however, there may still be some locally- or privately-maintained bridges that are not retrofitted.

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Dams and Reservoirs - There are 44 dams in or near Orange County, whose ownership ranges from the federal government to homeowners' associations. These dams hold billions of gallons of water in reservoirs or lakes, which are designed to protect Southern California from floodwaters and to store domestic water. Seismic activity can compromise these structures resulting in catastrophic flooding to downstream communities. For example, the Prado Dam was constructed in Riverside County just across the Orange County line to protect central Orange County from flooding. Much of the City of Santa Ana lies within Prado Dam's inundation zone in the event of its failure or collapse. The City of Santa Ana owns 10 water reservoirs throughout the City (see Section 2.4.6).

Damage to Critical Facilities - Critical facilities include police stations, fire stations, hospitals, shelters, government agencies and other facilities that provide essential services to the community. These facilities and their services need to be functional after an earthquake event.

Businesses - Seismic activity can cause great loss to businesses, for both large corporations and small local businesses. When a company is forced to stop production for even a day, the economic loss can be tremendous, especially when its market is at a national or global level. Many small businesses do not reopen after a disaster or fail shortly thereafter. Businesses that close, temporarily or permanently, result in lost jobs and wages, lost tax revenue, and the inability of residents to acquire products and services necessary to maintain daily subsistence or to recover from their own losses.

Debris - Damage to buildings, roadways and other structures will create a massive amount of debris, including brick and masonry, glass, wood, steel or concrete building elements, soil and roadway elements, home and business contents, and other materials. This will overwhelm the City's ability to remove the debris and overwhelm the ability of landfills and recycling and salvage operations to receive and dispose of debris.

Future Earthquake Probabilities

It is not possible to predict where and when an earthquake will occur, however it is possible to forecast the probability that a quake of a certain size will occur within a period of time. The Working Group on California Earthquake Probabilities is a multi-agency, multi-disciplinary team of earth scientists convened by the United States Geological Survey, the California Geological Survey and the Southern California Earthquake Center. In 2007, this group published the Uniform California Earthquake Rupture Forecast Version 2 (UCERF2), an update to an earlier earthquake forecast published in 1995.

This study presents a forecast of the probability of future earthquakes occurring in California. The study primarily focuses on the probability of a magnitude 6.7 or larger earthquake occurring within 30 years. Magnitude 6.7, the magnitude of the 1994 Northridge earthquake, was selected as a benchmark to represent a damaging and deadly earthquake. The 30-year period was selected primarily to assist earthquake insurance providers in establishing insurance coverage, but also relates to the usual term of home mortgages and approximates one human generation. The UCERF2 forecast estimated the probability of a M6.7 or larger earthquake occurring somewhere in California within 30 years to be 99.7%. The probability of a M6.7 or larger earthquake occurring somewhere in the Los Angeles region, which encompasses Orange County, within 30 years is 67%. For Southern California (roughly from San Luis Obispo County southward), these probabilities were provided for the next 30 years:

- M 6.7 or larger: 97%
- M 7.0 or larger: 82%
- M 7.5 or larger: 37%
- M 8.0 or larger: 3%

The southern California segment of the San Andreas Fault was rated as the most dangerous fault in California, having the highest likelihood for the next major earthquake, with a 59% probability of being the location of a M 6.7 or larger quake within 30 years.

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Earthquake as a Threat to Orange County - There are a large variety of earthquake events that could potentially affect Orange County and the City of Santa Ana. Figure 34 above shows the location of known faults in or near Orange County.

Predicted ground shaking patterns throughout Southern California for hypothetical scenario earthquakes are available from the United States Geological Survey as part of their on-going “ShakeMap” program. A ShakeMap is a representation of ground shaking produced by an earthquake. The information it presents is different from earthquake magnitude and epicenter because ShakeMap focuses on the ground shaking produced by the earthquake, rather than the earthquake source or energy released. Therefore, while an earthquake has one magnitude and one epicenter, it produces a range of ground shaking levels at sites throughout the region depending on distance from the earthquake, the rock and soil conditions at specific locations, and variations in the seismic waves from the earthquake due to the structure of the Earth's crust.

Earthquake scenarios are not earthquake predictions. That is, no one knows in advance when, where or how large a future earthquake will be. However, if we make assumptions about the size and location of a hypothetical future earthquake, we can make a reasonable prediction of the effects of the assumed earthquake, particularly the way in which the ground will shake. This knowledge of the potential shaking effects is the main benefit of the earthquake scenario for planning and preparedness purposes.

The following maps describe earthquakes in terms of Instrumental Intensity, which is a Modified Mercalli Intensity estimated from instrumental ground motion recordings. Figure 42 below provides the Modified Mercalli Intensity (MMI) Scale:

Figure 42 Modified Mercalli Intensity (MMI) Scale (Richter, 1958)

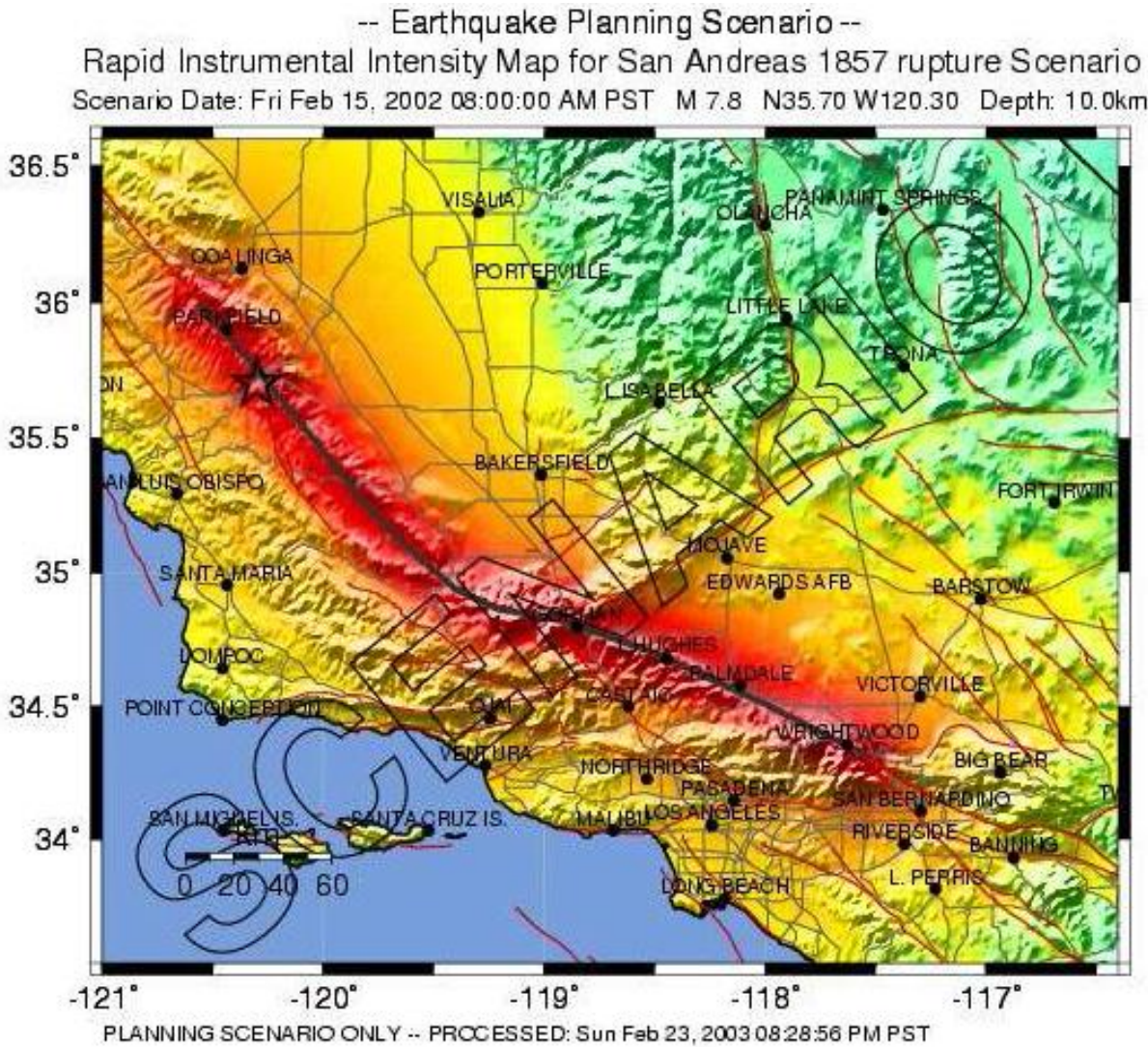
Value	Description
I	Not felt. Marginal and long period effects of large earthquakes.
II	Felt by persons at rest, on upper floors, or favorably placed.
III	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy weight striking the walls. Parked cars rock. Windows, dishes, doors rattle. Glasses clink. In the upper range of IV, wooden walls and frames creak.
V	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and Masonry D cracked. Trees, bushes shaken visibly, or heard to rustle.
VII	Difficult to stand. Noticed by drivers of cars. Hanging objects quiver. Furniture broken. Damage to Masonry D, including cracks. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in Masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Concrete irrigation ditches damaged.
VIII	Steering of cars affected. Damage to Masonry C; partial collapse. Some damage to Masonry B; none to Masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Tree trunks broken. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Masonry D destroyed; Masonry C heavily damaged, sometimes with complete collapse; Masonry B seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected; earthquake fountains and sand craters form.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Rails bent greatly. Underground pipelines completely out of service.
XII	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.
Masonry A	Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.
Masonry B	Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.
Masonry C	Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.
Masonry D	Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

Each of the major local fault systems is described briefly on the pages that follow, with Shakemaps depicting ground shaking patterns for eight scenarios potentially impacting Orange County, including:

- M 7.8 Repeat of the 1857 Fort Tejon Earthquake on the San Andreas Fault
- M 7.8 Event on the Southern San Andreas Fault “ShakeOut Scenario”
- M 6.9 Earthquake on the Newport-Inglewood Fault
- M 6.8 Earthquake on the Elsinore Fault
- M 6.8 Earthquake on the Whittier Fault
- M 6.7 Earthquake on the Chino Hills Fault
- M 6.6 Earthquake on the San Joaquin Hills Fault
- M 7.1 Earthquake on the Puente Hills Fault

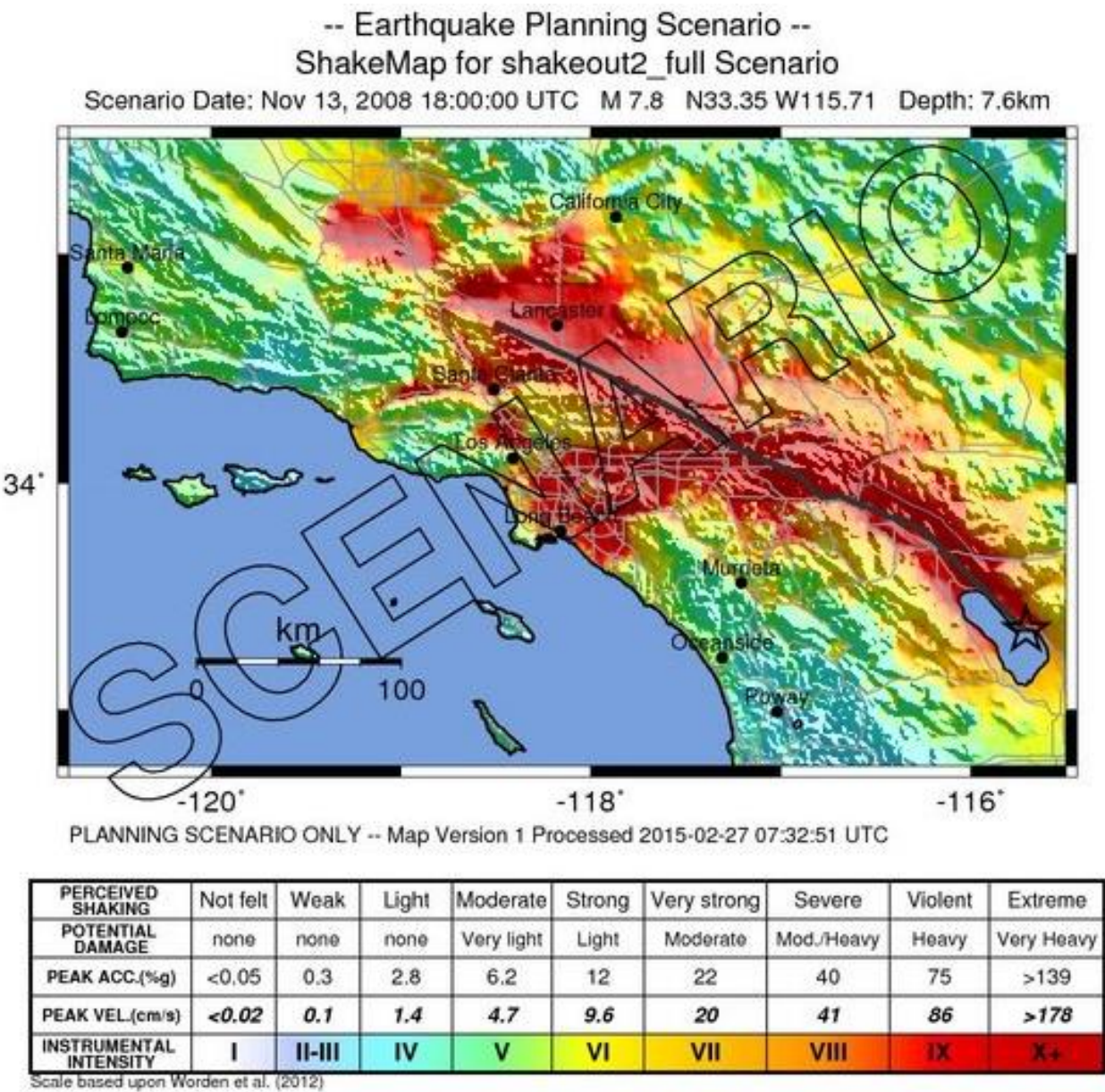
San Andreas Fault Zone: The dominant active fault in California, it is the main element of the boundary between the Pacific and North American tectonic plates. The longest and most publicized fault in California, it extends 750 miles from Cape Mendocino in northern California to the Salton Sea in Imperial County, and is approximately 45 miles northeast of Santa Ana. This fault was the source of the 1906 San Francisco earthquake, which resulted in some 700 deaths and millions of dollars in damage. The southern section of this fault is currently of the greatest concern to the scientific community. Geologists can demonstrate that at least eight major earthquakes (M 7.0 and larger) have occurred along the Southern San Andreas Fault in the past 1200 years with an average spacing in time of 140 years, plus or minus 30 years. The last such event on the Southern San Andreas was over 160 years ago (the Fort Tejon Earthquake in 1857). The range of probable magnitudes on the San Andreas Fault Zone is reported to be 6.8 to 8.0.

Figure 43 M 7.8 Repeat of the 1857 Fort Tejon Earthquake on the San Andreas Fault



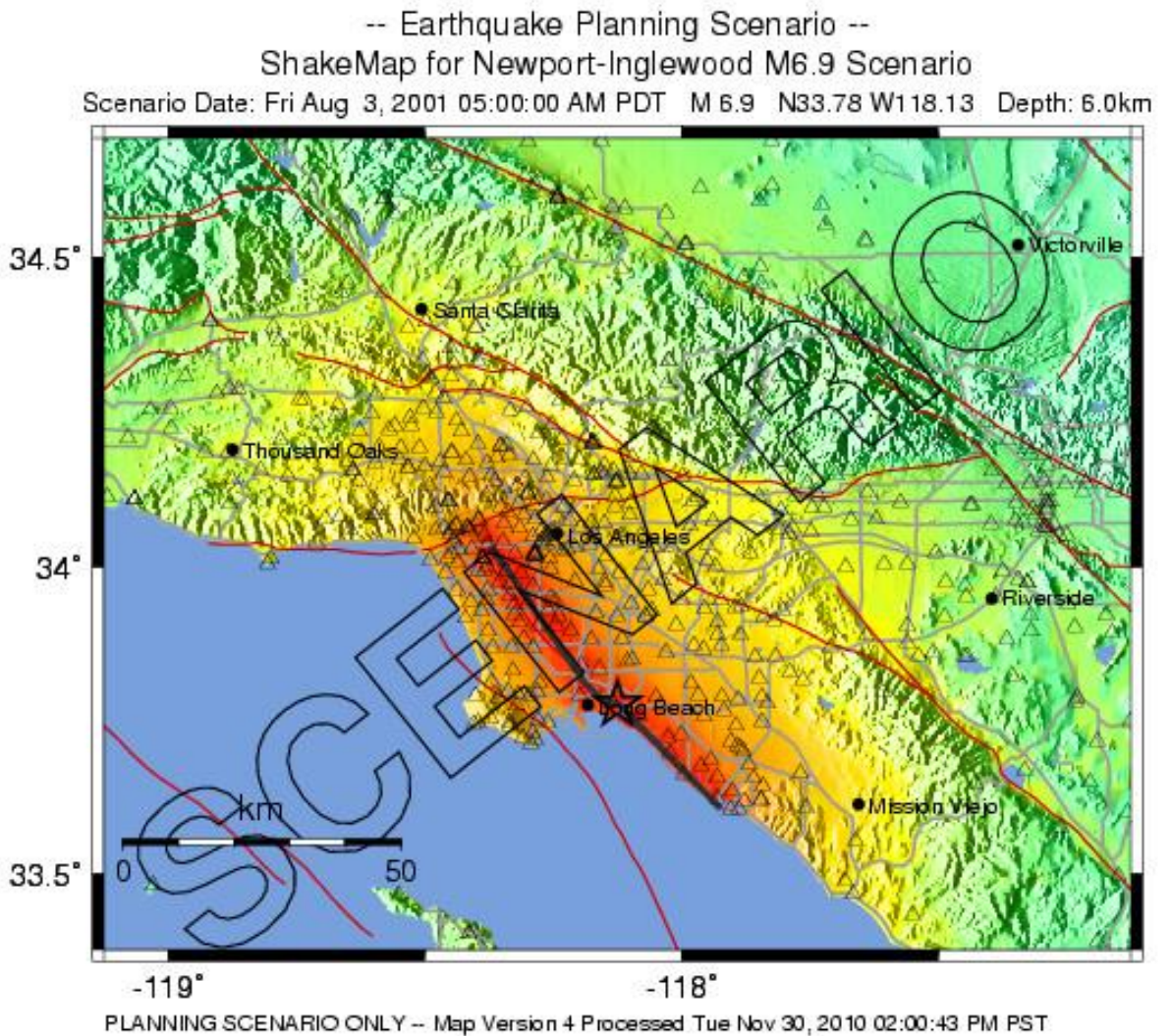
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16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

Figure 44 M 7.8 Event on the Southern San Andreas Fault “ShakeOut Scenario”



Newport-Inglewood Fault Zone: This fault extends from the Santa Monica Mountains southeastward to Orange County, paralleling the coast to Newport Beach and then continues paralleling the coast offshore to southern Orange County. This was the source of the destructive 1933 Long Beach Earthquake (magnitude 6.4), whose epicenter was in Huntington Beach and which caused 120 deaths and considerable property damage. Orange County was sparsely populated at the time but three of the four deaths occurring in Orange County occurred in downtown Santa Ana. The original Santa Ana City Hall, previously located at Third and Main Streets on the site of the current Old City Hall, was destroyed by this earthquake, as was the original Santa Ana High School. During the past 60 years, numerous other shocks ranging from magnitude 3.0 to 5.0 have been recorded. The Southern California Earthquake Center (SCEC) reports probable earthquake magnitudes for the Newport-Inglewood fault to be in the range of 6.0 to 7.4 with an unknown recurrence interval.

Figure 45 M 6.9 Earthquake on the Newport-Inglewood Fault

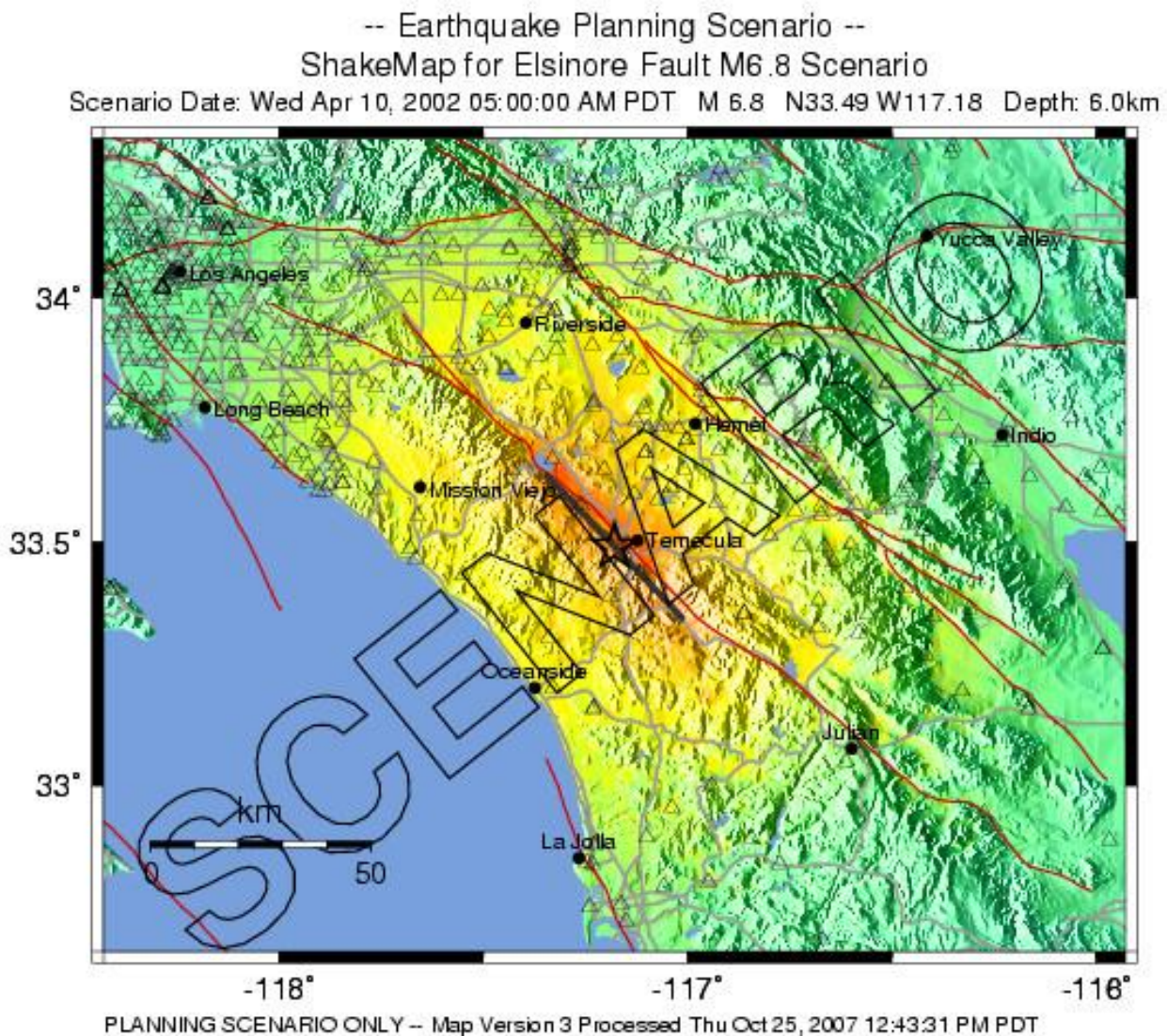


PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16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

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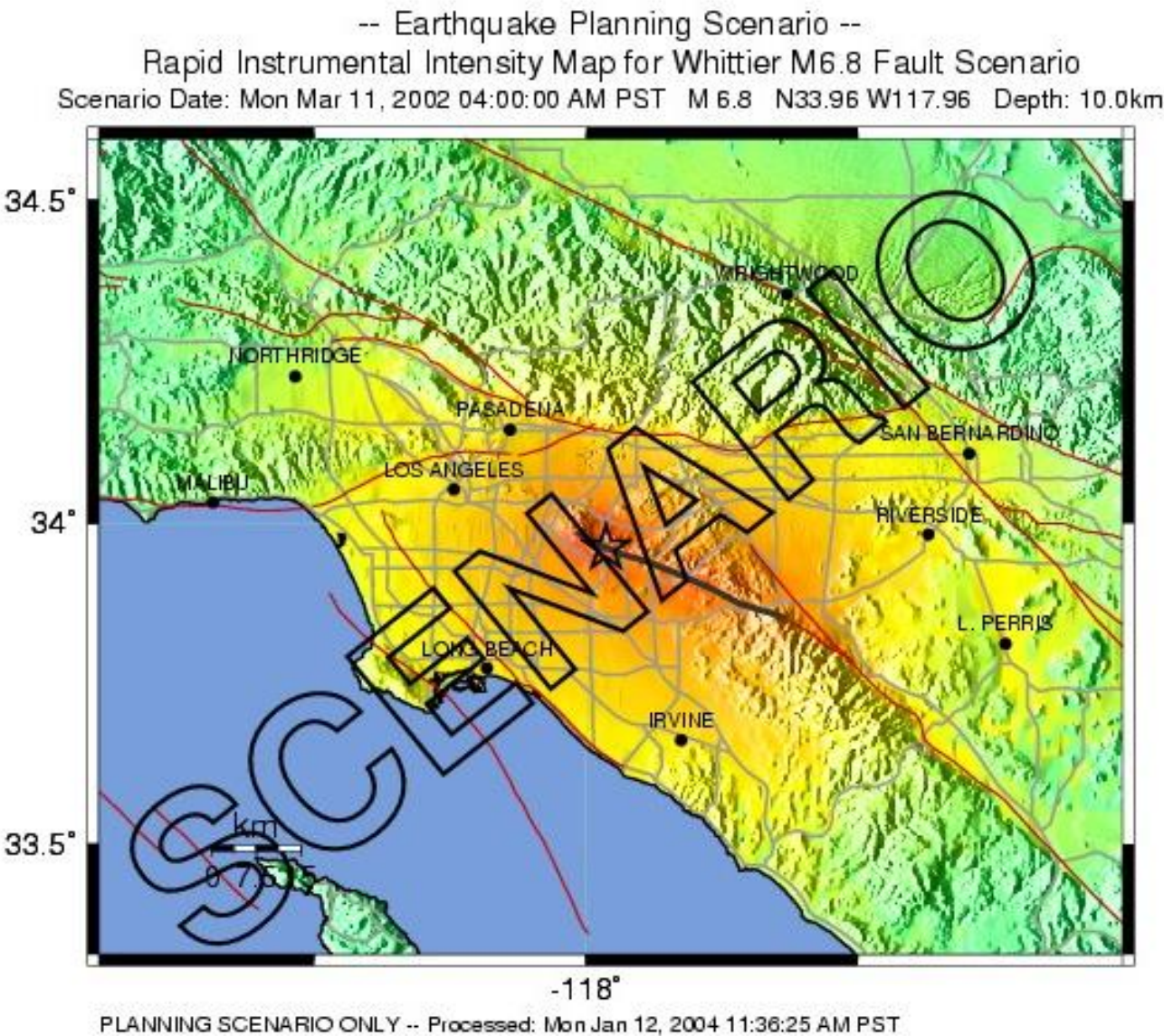
Elsinore Fault Zone: Located along the eastern border of the Orange County, this fault follows a general line east of the Santa Ana Mountains southward into Mexico. The main trace of the Elsinore Fault zone is about 112 miles long. The last major earthquake on this fault occurred in 1910 (M 6.0), and the interval between major ruptures is estimated to be about 250 years. SCEC reports probable earthquake magnitudes for the main trace of the Elsinore fault to be in the range of 6.5 to 7.5. At the northern end of the Elsinore Fault zone, the fault splits into two segments: the 25-mile-long Whittier Fault (probable magnitudes between 6.0 and 7.2, unknown recurrence), and the Chino Fault (mentioned below).

Figure 46 M 6.8 Earthquake on the Elsinore Fault



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

Figure 47 M 6.8 Earthquake on the Whittier Fault

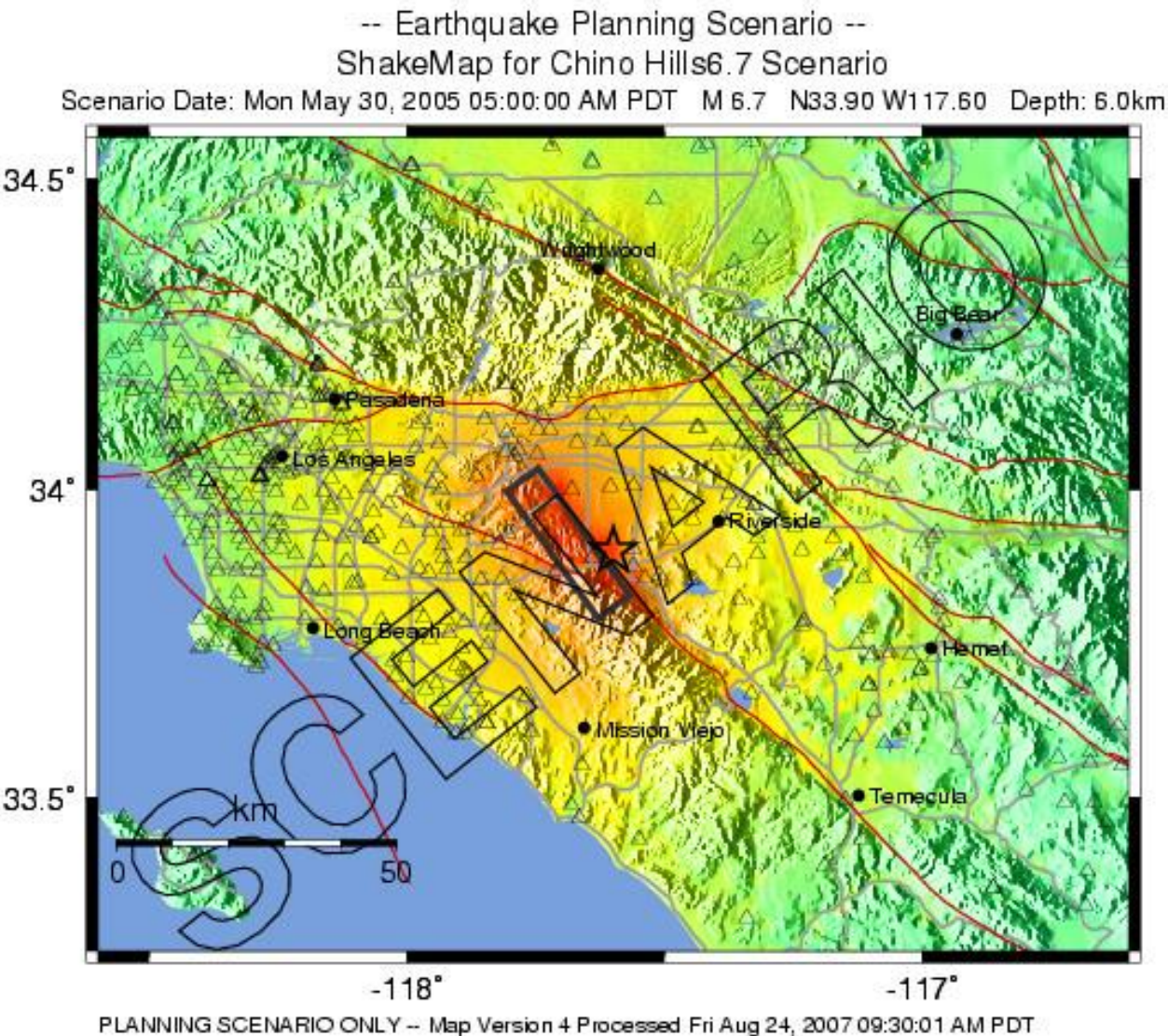


PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16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

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Chino Fault- The Chino Fault is a right-reverse fault and is part of the Whittier-Elsinore Fault system and is located northeast of Chino Hills. The fault is approximately 17.4 miles long and extends from the Santa Ana Mountains northwest to the City of Pomona, as it joins the San Jose Fault. SCEC reports probable earthquake magnitudes for the Chino Fault to be in the range of 6.0 - 7.0 with an unknown recurrence interval. The last earthquake reported was on July 29, 2008 with a magnitude of 5.4, which resulted in mild shaking but little damage in Orange County.

Figure 48 M 6.7 Earthquake on the Chino Hills Fault



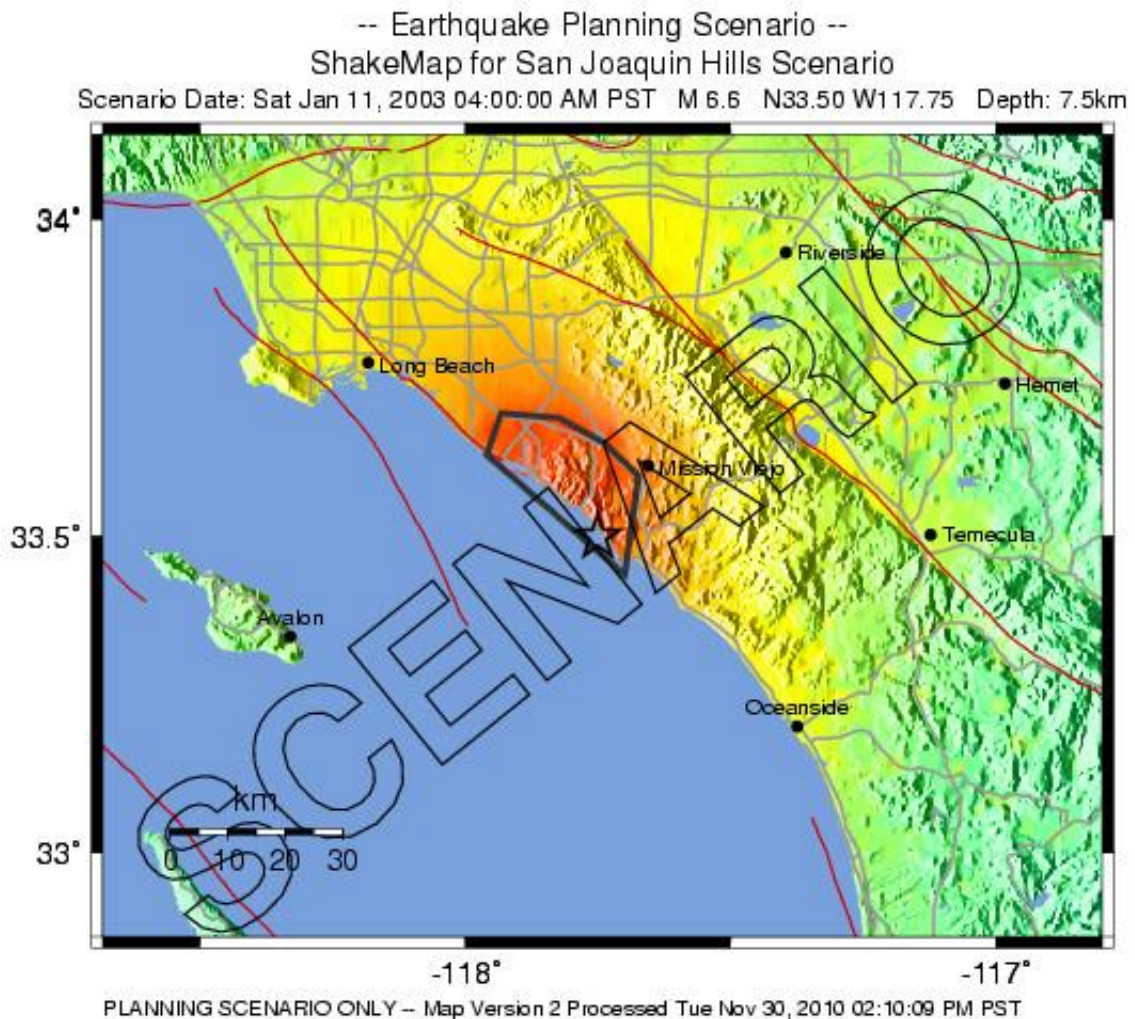
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16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

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San Jacinto Fault Zone: This 130-mile-long fault is located approximately 30 miles north and east of the county and parallels the near side of the San Andreas Fault. The San Jacinto Fault was active with several earthquakes in the first half of the 20th century. The most recent event (1968 M6.5) occurred on the southern half of the Coyote Creek segment. The estimated recurrence interval between ruptures is between 100 and 300 years, per segment with probable magnitudes in the range of 6.5 to 7.5.

San Joaquin Hills Fault: Recently discovered in the 1990's, this fault originates near the Newport-Inglewood Fault close to Huntington Beach and runs south, paralleling the 405 and 73 Freeways at the western margins of the San Joaquin Hills. Rupture of the entire area of this blind thrust fault could generate an earthquake as large as M 7.3. Fortunately, the average recurrence interval for moderate-sized earthquakes on this fault has been estimated between about 1,650 and 3,100 years with the last major rupture occurring in 1769.

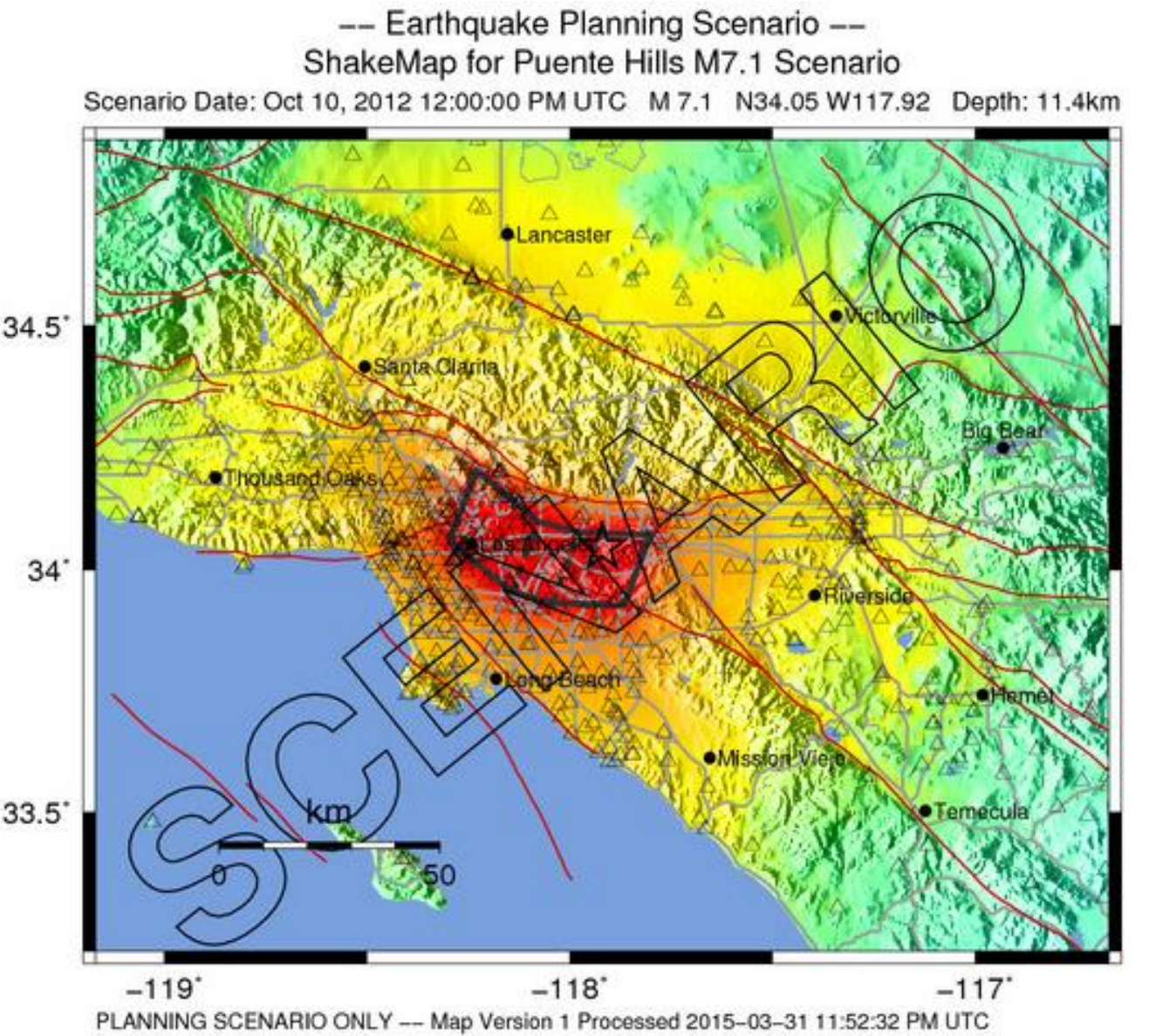
Figure 49 M 6.6 Earthquake on the San Joaquin Hills Fault



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

Puente Hills Thrust Fault: This is another recently discovered blind thrust fault that runs from northern Orange County to downtown Los Angeles. This fault is now known to be the source of the 1987 Whittier Narrows Earthquake. Recent studies indicate that this fault has experienced four major earthquakes ranging in magnitude from 7.2 to 7.5 in the past 11,000 years, but that the recurrence interval for these large events is approximately several thousand years.

Figure 50 M 7.1 Earthquake on the Puente Hills Fault



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999

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In addition to the major faults described above, rupture of a number of smaller faults could potentially impact Orange County, including the Norwalk Fault (located in the north of the county in the Fullerton area), the El Modena Fault (located in the City of Orange area), and the Peralta Hills Fault (in the Anaheim Hills area). Undiscovered blind faults may also emerge at any time.

Addressing the Earthquake Hazard

In California, many agencies are focused on seismic safety issues: the State's Seismic Safety Commission, the Applied Technology Council, California Office of Emergency Services, United States Geological Survey, Cal Tech, the California Geological Survey, as well as a number of universities and private foundations. These organizations, in partnership with other state and federal agencies, have undertaken a rigorous program in California to identify seismic hazards and risks including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction, and earthquake-induced landslides. Seismic hazard maps have been published and are available for many communities in California through the State Division of Mines and Geology.

In California, each earthquake is followed by revisions and improvements to Building Codes. The 1933 Long Beach Earthquake resulted in the first seismic safety standards in building codes, including the Field Act requiring earthquake-resistant school construction. The 1971 Sylmar (or San Fernando) earthquake brought another set of increased structural standards. Similar re-evaluations occurred after the 1989 Loma Prieta and 1994 Northridge earthquakes. These code changes have resulted in stronger and more earthquake resistant structures.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971 Sylmar Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, hospitals, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard and this Act prohibits construction atop earthquake faults.

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

2.4.2 Weapon of Mass Destruction/Terrorism

Terrorism is defined as the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. Terrorism is not an ideology; it is a strategy used by individuals or groups to achieve their political goals. No areas in our country are truly secure or resistant from either domestic or foreign terrorist agents. Terrorism affects us through physical injuries, property destruction, economic losses, fear and psychological trauma, and erosion of faith in government. This is accomplished by creating a mass casualty event and/or causing substantial damage to critical infrastructure, using Weapons of Mass Destruction (WMD) devices or agents. In addition to loss of life and property destruction, a WMD incident in the City of Santa Ana would cause severe disruptions to schools, businesses, government services and travel within the City, resulting in a severe economic and psychological impact to the City and region.

Terrorism and WMDs emerged as significant threats in the United States in the 1990's. In February 1993, a truck bomb was exploded in the parking garage of the World Trade Center in New York City, killing six people, injuring more than 1,000 and requiring the evacuation of more than 50,000. This bombing was carried out by several non-US citizens with grievances rooted in the Middle East Palestinian conflict. In April 1995, two US citizens and former US Army soldiers with grievances against the federal government destroyed the Alfred Murrah Federal Building in Oklahoma City with a truck bomb, killing 168 people and injuring more than 500 others.

The September 11, 2001 al Qaeda attacks on New York City's World Trade Center and the Pentagon in Washington DC, utilizing hijacked airplanes as weapons, not only established terrorist attacks as a permanent threat within the United States, but also established that terrorist attacks can rise to the level of disasters, with casualties and losses equivalent to major earthquakes, tornados or hurricanes. The attack killed almost 3,000 people (including more than 400 firefighters and police officers), injured thousands more, and caused immediate financial losses and costs over \$200 billion dollars. The attacks paralyzed travel, commerce and government functions in New York City and Washington DC for days; paralyzed air travel throughout North America for days; and created substantial and permanent new security burdens on airlines and their passengers.

Terrorist Groups and Motivations

The threat of both domestic and international terrorist groups and organizations has substantially increased from several decades ago. Terrorists espouse a wide range of causes. They can be for or against almost any issue, religious belief, political position, or group of people of one characteristic or another.

The US Department of Homeland Security reports that Foreign Terrorist Organizations (FTO) such as the Islamic State of Iraq and Syria (ISIS) and al-Qaeda continue to inspire and encourage followers to conduct attacks against the West. FTO propaganda encourages attacks against law enforcement and government personnel in the US, including online publications and video messages calling for individuals to strike police, security, and intelligence members, as well as their "treacherous agents", in addition to multiple soft targets. These calls for attacks can motivate Homegrown Violent Extremists (HVE) or FTO-inspired individuals to attempt attacks locally. FTOs highly encourage followers and potential HVEs to use simple attack tactics such as vehicle ramming, small arms gunfire, and the use of edged weapons (blades, knives, axes, etc.), which take little to no preparation but can result in serious injuries or fatalities, especially in places of mass gatherings. Additionally, there are new terrorist tactics emerging within the United States of individuals who are unaffiliated with a terrorist organization but who act alone or in small groups, such as the San Bernardino active shooter attack in December 2015.

The US Department of Homeland Security defines Sovereign Citizen Extremists (SCE) as groups or individuals who facilitate or engage in acts of violence directed at public officials, financial institutions, and government facilities in support of their belief that the legitimacy of US citizenship should be rejected; that almost all forms of established government, authority, and institutions are illegitimate; and that they are immune from federal, state, and local laws. SCEs believe they personally can ignore laws and act according to their own sovereign citizen ideology. Consequently, when SCEs perceive government representatives directly infringing on their rights

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and freedoms in an irrevocable way - such as police enforcement actions, judicial rulings, or other government decisions or policies - SCEs can resort to violence.

The US Department of Homeland Security defines militia extremists as groups or individuals who facilitate or engage in acts of violence directed at federal, state, or local government officials or infrastructure in response to their belief that the government deliberately is stripping Americans of their freedoms and is attempting to establish a totalitarian regime. These individuals consequently oppose many federal and state authorities' laws and regulations (particularly those related to firearms ownership), and often belong to armed paramilitary groups. They often conduct paramilitary training designed to violently resist perceived government oppression or to violently overthrow the US Government.

Groups with Neo-Nazi or white supremacist ideologies have surged in membership and activity in recent years. Racially or Ethnically Motivated Violent Extremists (RMVEs) use their belief in the superiority of the white race to justify use of violence against other races, ethnicities, religions or sexual orientations.

Weapons of Mass Destruction

Terrorists commonly attempt to accomplish their aims by creating a mass casualty event using WMD or CBRNE (Chemical, Biological, Radiological, Nuclear or Explosive) devices or agents. Title 18 of the United States Code (U.S.C.) defines WMD/CBRNE weapons as:

- Any explosive, incendiary, or poison gas, including the following: a bomb; grenade; rocket having an explosive or incendiary charge of more than four ounces; missile having an explosive or incendiary charge of more than one-quarter ounce; mine; or device similar to any of the previously described devices;
- Any weapon that is designed or intend to cause death or serious bodily injury through the release, dissemination, or impact of toxic or poisonous chemicals, or their precursors;
- Any weapon involving a disease organism; and
- Any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

Chemical agents are intended to kill, seriously injure, or incapacitate people through destruction of human tissue or disruption of bodily functions. Chemical agents can be manufactured as military weapons or can be improvised from common industrial or household products. The onset of symptoms that result from chemical weapons can range from immediate to 18 hours following exposure. There are five categories of chemical weapons:

- Blister agents cause blisters, burns, and other tissue damage. Exposure may be made through liquid or vapor contact with any exposed skin, or by inhalation or ingestion. The effects of blister agents may be similar to those experienced with riot-control agents like “tear” gas but do not clear upon movement into fresh air. In fact, the effects of most blister agents increase with time and may not reach their full impact for 12 to 18 hours. Blister agents include several families of chemicals, including mustard and lewisite, which were used during the chemical warfare attacks during World War I and burned the skin and lungs of exposed persons.
- Blood agents are absorbed into the bloodstream and deprive blood cells of oxygen. Exposure may be made through liquid or vapor contact with any exposed skin, or by inhalation or ingestion. Blood agents include two main families of chemicals, including hydrogen cyanide and cyanogen chloride. Those who are affected by blood agents may appear “bluish” across the nose and cheeks and around the mouth. As the symptoms of blood agents progress, the survivor will convulse and lose consciousness.
- Choking agents attack the lungs. Following exposure through inhalation, the lungs fill with fluid, which prevents oxygen from being absorbed by, and carbon dioxide from being removed from, the blood. Death results from lack of oxygen and is similar to drowning. Two common examples of choking agents are phosgene and chlorine gas, also frequently used during World War I.
- Nerve agents affect the central nervous system. These agents act most quickly and are the most lethal of all chemical agents, acting within seconds of exposure. Victims of nerve agents experience constricted pupils, runny nose, shortness of breath, convulsions, and cessation of breathing. Sarin is an example of a nerve agent. In 1995, Aum Shinrikyo, a doomsday religious cult, released Sarin gas into the Tokyo, Japan subway system

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during rush hour, killing 12 people, injuring 50 and causing temporary vision impairment to nearly 5,000 others. Chemical weapons attacks in the Syrian Civil War are also believed to have used Sarin gas.

- Riot-control agents cause respiratory distress and tearing and are designed to incapacitate rather than kill. Riot-control agents cause intense pain, especially when in contact with mucus membrane in areas such as the eyes, nose, and mouth. Common riot-control agents include “tear” gas and capsaicin (also called pepper spray). Though usually not fatal, they may cause a dangerous panic if used in a crowded environment.

Biological agents are intended to kill, seriously injure, or incapacitate people by causing illness through the introduction of a disease organism. Biological agents usually work at a much slower pace than exposure to chemical agents. People may not initially know they have been exposed and those who become infected may not feel sick for some time. They may initially mistake their symptoms for common illnesses like the flu. The incubation period may range from several hours to a few weeks, depending on the exposure and pathogen. Some biological agents may be contagious and some victims may serve as carriers of the disease with the capability of infecting others. Unlike acute incidents involving explosives or chemicals, the initial detection and response to a biological attack on civilians is likely to be made by direct patient care providers (doctor’s offices, hospital emergency rooms, pharmacies) and public health departments. There have been only two confirmed cases of biological agents being intentionally released against the public in history, both occurring in the United States.

In the first example, members of the Rajneeshee religious cult in Wasco County, Oregon attempted to manipulate the November, 1984 local elections after being denied building permits and experiencing other land use conflicts with local officials while they were attempting to greatly expand the size of their commune. Cult members nominated several of their own members in races for various local offices. The cult then obtained Salmonella bacteria from a medical supply company and in the weeks before the election, spread bacteria-tainted liquid on produce in grocery stores, on doorknobs throughout government office buildings, and distributed the material onto salad bars at 10 restaurants throughout The Dalles, Oregon where most of the voters in the district lived. The intent was to sicken or kill a large number of voters in the district before Election Day, so that the cult could elect their own members into office. 751 people were sickened in the attempt, although all survived.

The second example occurred immediately after the September 11, 2001 terrorist attacks, when multiple news media outlets and several Democratic US Senators received letters in the US Mail laced with anthrax spores. Anthrax is a naturally occurring bacterium which can be refined into a highly toxic substance. Inhaled anthrax causes cold and flu-like respiratory symptoms, which if not correctly diagnosed and treated rapidly, lead to pneumonia and fatal respiratory collapse. These anthrax exposures ultimately killed 5 people and sickened 17 others, although none of the actual victims were the intended targets, instead they were mail handlers or completely unrelated persons whose mail was contaminated by contact with the tainted letters.

Radiological weapons are intended to kill, seriously injure or incapacitate people through the dispersal of radioactive material, and are also called radiation dispersal devices (RDDs) or dirty bombs. Radiological materials are readily available in hospitals and other medical facilities, in university science laboratories, and in many products with commercial uses. Examples are x-ray machines and particle accelerators used in scientific research. Radiation cannot be seen or otherwise detected by human senses, but high doses or prolonged exposure can cause radiation sickness and death.

Terrorists who would attack using an RDD would need relatively small amounts of radioactive material to make an effective device. RDDs may be improvised explosive devices in which radioactive material is packaged into a conventional explosive and upon detonation, the radioactive material is scattered throughout the community. It is not necessary to use a bomb to disperse radioactive materials; these materials come in solids, liquids, and powdered forms which can be spread covertly.

RDDs are considered a much higher threat than nuclear weapons because radiological materials are much easier to obtain than enriched nuclear materials, and the technology required to detonate an RDD is similar to that involved in detonating conventional explosives. In a conventional explosion involving radioactive materials, the fact that radioactive material was involved may not be obvious. Unless responders have proper detection

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equipment and have been trained to use it properly, the presence of a radiation hazard may not be discovered until people begin experiencing symptoms of radiation poisoning.

Nuclear devices are explosive devices that derive their destructive force from a nuclear reaction. Nuclear devices cause deadly effects when exploded, including blinding light, intense heat, blast damage, nuclear radiation, intense fires, and widespread radioactive fallout that contaminates air, water and soil for miles. A nuclear device can range from an intercontinental ballistic missile launched by a hostile nation or terrorist organization, to a small portable device transported by an individual in a vehicle, suitcase or other large package.

A terrorist attack with a nuclear weapon would impact a much larger area than a conventional explosion, would cause intense radiation sickness to those not killed in the explosion but exposed to contamination, and would create long term health effects to humans, animals and food and water supplies. However, the ability to obtain enriched nuclear materials, to design a successful nuclear explosion and to deliver the device to a target is much more difficult and expensive to carry out than other terrorist tactics, making a nuclear attack much less likely.

Conventional Explosive devices are used to kill, seriously injure, or incapacitate people through physical injury and to destroy structures. Conventional explosives are easily obtained and constructed and are by far the weapon of choice for terrorists. The components are readily available, as are detailed instructions on constructing such a device. They are easily hidden or deployed and can cause extensive damage. These devices may be constructed from military grade bombs or weapons captured or abandoned in war zones, but can also be easily constructed as improvised explosive devices (IED's). IED's can be assembled from readily available materials, including commercially available fertilizer and petroleum products, blasting products used in construction or demolition industries, or products available to any consumer like fireworks, gasoline, diesel fuel or propane tanks. Secondary explosive devices may also be used as weapons against police and medical responders arriving in response to the explosion of a primary device.

Alternative Weapons or Tactics – Terrorist tactics change as prevention and protection efforts improve against previously used tactics. Alternative weapons and tactics are often low cost, using easily available items and can be carried out almost spontaneously with little planning or preparation. (See Targeted Act of Violence Assessment Section 2.4.9) These include:

- **Active Shooters** –Utilizing high-capacity firearms to shoot as many persons as possible in crowded venues before intervention by law enforcement or other resistance.
- **Vehicles as Weapons** – Driving a car or truck into a crowded pedestrian plaza, shopping market or other public gathering.
- **Combined Coordinated Attacks** – Multiple active shooters attacking multiple public gathering spots simultaneously, which can also be combined with conventional explosive devices to increase injuries and panic, to impede evacuation or escape, or to slow or impair the response of police or medical responders.

Cyber-Terrorism - Cyber-attacks and intrusions can be used by criminals, terrorists, insiders, and hostile foreign nations to mask other attacks, shake citizens' confidence in the government, damage the economy or disrupt delivery of essential services. As this threat continues to grow and evolve, concerns about the potentially severe consequences of an effective cyber-attack against critical infrastructure facilities and systems increases. Cyber threats result in the denial or disruption of essential services, including utilities, public health, finance, or law enforcement networks.

A variety of attacks can be conducted by skilled cyber actors intent on harming municipal interests. Cyber threats range from stealing organizational data, interrupting operational efforts, or sabotaging or destroying physical technological infrastructure. In the past, cyber actors have targeted multiple Orange County entities. Common tactics have included the use of ransom-ware, website defacements, distributed denial of service (DDoS) attacks, or doxing (releasing hacked documents which reveal personal or confidential information about individuals, businesses or government functions).

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Advanced state-sponsored cyber actors and criminal hackers may also use malware as a means to obtain and maintain persistent illicit access to targeted networks to facilitate denial and destruction of data, cyber espionage, and commit other types of fraudulent activity.

- Following a high-profile Orange County court case in 2014, the hacktivist group Anonymous targeted law enforcement officers and city council officials by releasing personal information, home addresses, phone numbers, and the names of family members through social media networks.
- A municipal city and several local public-safety agencies in Southern California in early June 2014 were infected by ransomware, resulting in the compromise of more than 100 computers and 10 servers.

Local Vulnerabilities and Hazards

Due to the tremendous variety of causes supported by terrorists and the wide variety of potential targets, there is no place that is truly safe from terrorism. California's population, industrial infrastructure, economic importance, international reputation and numerous iconic features combine to make the state a potential target for both domestic and international terrorist attacks. Throughout California, there are nearly a limitless number of potential targets, depending on the perspective of the terrorist. Some of these targets include reproductive health clinics, religious facilities, government offices, public places (such as shopping centers and entertainment venues), schools, power plants, refineries, utility infrastructure, water storage facilities, dams, financial institutions, and other businesses.

The Federal government defines critical infrastructures as systems whose "incapacity or destruction would have a debilitating impact on the defense or economic security of the nation." For Orange County, these services include telecommunications, electrical power systems, gas and oil storage facilities, transportation, water supply systems, wastewater systems, and government and emergency services. Facilities that store, use or produce hazardous materials (HazMat) are not only critical to the economy, but the HazMat substances themselves could be used as a weapon. On a municipal level, critical infrastructure could include police stations, fire stations, city offices, community centers, theaters, sport centers, educational facilities, religious facilities, banks, shopping centers, power stations, transmission lines, telephone relays, drinking water supplies, water treatment facilities, restaurants, and grocery stores; all are potential terrorist targets.

Various public and private entities in the City of Santa Ana entities are susceptible to targeting by various political, single-issue, or anti-government extremists who continue to pose a threat to government facilities due to perceived infringements on their rights and freedoms by government officials or law enforcement personnel.

The Santa Ana Civic Center is a concentrated collection of City of Santa Ana, County of Orange, State of California and United States federal government office buildings and agency headquarters, including Santa Ana City Hall, Santa Ana Police Department and Jail, Orange County Sheriff's Department and Jails, most Orange County agency headquarters, various state and federal agency headquarters, and the County, State and Federal Courthouses. A group or individual with grievances against almost any governmental entity or function can find a target in the Civic Center, or a group or individual that wants to harm government in general can cause widespread impacts in the Civic Center, disabling all levels and branches of government in one act.

2.4.3 Extreme Temperature

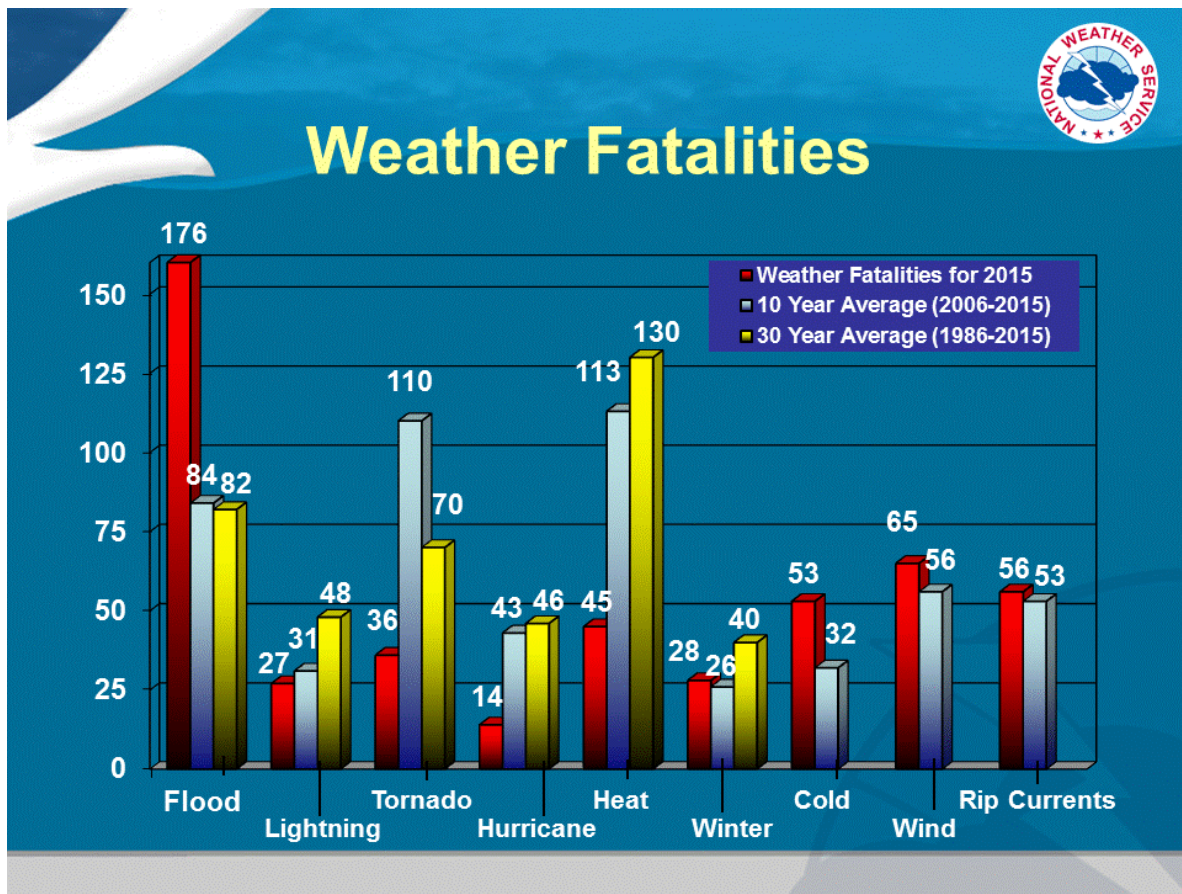
Extreme Heat - Climate and History

The City of Santa Ana experiences a generally moderate summertime climate; but extreme heat is not uncommon and can pose a threat to various populations in the City. The National Weather Service (NWS) Weather Station located in Santa Ana at Orange County Fire Authority Station 75 (the former Santa Ana Fire Department Station 5, near First and Main Streets) has been recording weather data for more than a century. Summertime high temperatures in the City usually average in the mid to high 80 degrees, but almost every year has recorded multiple days exceeding 100 degrees.

The NWS defines “excessive heat” as either a combination of high (significantly above average) temperatures and high humidity, or alternatively as high ambient air temperatures lasting for a prolonged period of time.

Heat waves do not cause visible property damage or generate the emergency response that earthquakes, fires or floods do, but they may claim more lives. For example, the 1989 Loma Prieta Earthquake and the 1994 Northridge Earthquake each claimed approximately 60 lives. In comparison, a July 2006 heat wave in California caused the deaths of 140 people over a 13-day period, more than both earthquakes combined. Excessive heat can be less dramatic but more deadly. Heat emergencies develop slowly and may take a number of days of high temperatures to have a significant or measurable impact. Excessive heat does not endanger lives immediately, but instead the cumulative effects slowly affect the body’s ability to cope, with the possibility of death for some vulnerable populations. According to the National Weather Service, heat is one of the leading causes of death from any weather-related hazard:

Figure 57 Weather-Related Fatalities



<http://www.nws.noaa.gov/om/hazstats/images/hazstat-chart15-lg.gif>

National Weather Service Products and Information

Orange County's weather forecasts are provided by the National Weather Service San Diego Weather Forecast Office (NWS-San Diego). There are three National Weather Service Zones in Orange County. It is important to understand Orange County weather zones, as weather forecasts may not affect all of Orange County in the same way. For example, it may be cooler along the coast than in inland Orange County. These forecast zones are:

- **Orange County Coastal** covers the immediate coastal region, including beaches and coastal cities west of I-405 and the southern portion of I-5.
- **Orange County Inland** includes the inland coastal valleys and plains of Orange County, mainly east of I-405 and including most of the I-5 corridor. The City of Santa Ana lies in the Orange County Inland zone.
- **Santa Ana Mountains and Foothills** includes the Orange County unincorporated canyon areas and Cleveland National Forest areas in South Orange County.

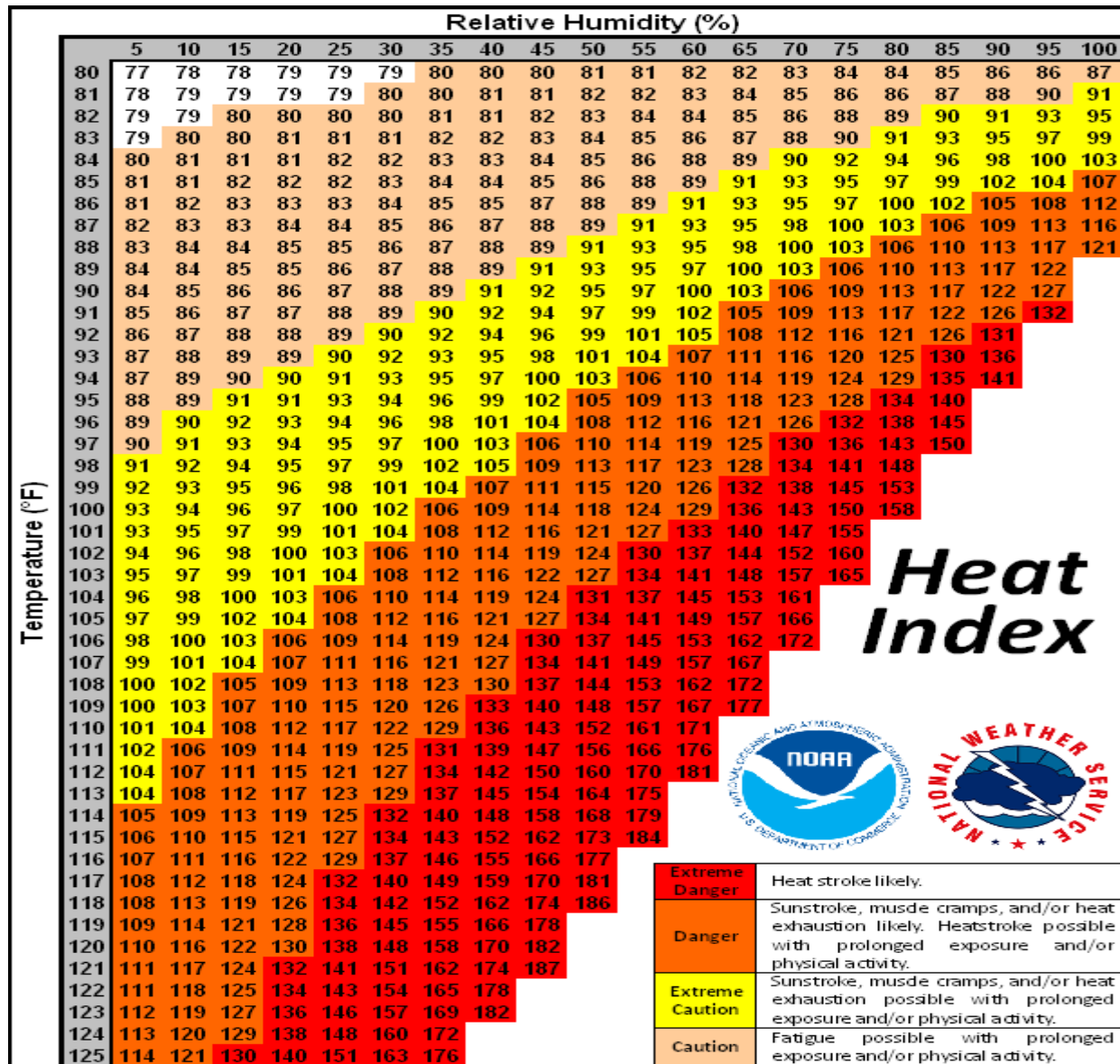
The National Weather Service issues a variety of Hot Weather notices when temperatures are forecast to be unusually high. The guidelines for these notices in Orange County are:

- A **Heat Advisory** is issued within 48 hours of the onset of a short-duration heat event when daytime temperatures are well above average but the temperature cools at night. A Heat Advisory is issued for the Orange County Inland zone when temperatures are forecast to exceed 100 degrees for one to three days in more than one city.
- An **Excessive Heat Watch** is issued when there is a potential for an Excessive Heat Warning to be issued within the next 24 to 72 hours, but the exact timing and occurrence are still uncertain.
- An **Excessive Heat Warning** is issued within 48 hours of a longer-duration heat event of 3 days or more. An Excessive Heat Warning is issued for Orange County Inland when ambient air temperature will meet or exceed 105 degrees, or the Heat Index (see below) will exceed 110 degrees. These sustained heat events, with less cooling opportunity for people to recover from heat effects, result in more cumulative health impacts.

Heat Vulnerabilities and Risk Factors

Heat Index – The Heat Index captures how hot the combination of air temperature and relative humidity feels to people. As humidity increases, the air seems warmer than it is because the body is unable to cool itself by evaporation of perspiration. As the Heat Index rises, so do health risks. In Southern California, we experience less humidity in our weather, so air temperature is the dominant factor.

Figure 59 Heat Index



Some populations pose an additional challenge in that people can be affected by heat more quickly or more severely based on other underlying factors, including age, health and lifestyle choices or circumstances. Individuals possessing any combination of the following characteristics or conditions are at greater risk for experiencing a serious, temperature-attributable illness or injury:

- **Age and underlying conditions:** This at-risk group includes infants and older people (65 and older) who may be more susceptible to the effects of extreme heat due to their physiology and state of health, or who may be unable to express signs or recognizable symptoms of heat exposure. It includes people with underlying medical conditions (e.g., heart disease, diabetes, asthma, malnutrition, substance abuse) that may be exacerbated during extreme heat.
- **Cognitive impairments:** People with mental illnesses, with cognitive disorders, or under the influence of drugs or alcohol may be unable to make rational decisions that would help limit their exposure to excessive heat or to recognize symptoms of excessive heat exposure. In addition to impairing judgment, alcohol, sedatives and other legal or illegal medications or controlled substances may impair the body's ability to maintain normal body temperature.

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- **Mobility constraints:** People with mobility constraints are at higher risk during extreme heat if the constraints limit their ability to access appropriately cooled locations. This group includes the very young, the elderly, the very obese, the bedridden, and those with other access and functional needs that may affect mobility.
- **Economic constraints:** The poor may be disproportionately at risk during extreme heat if their homes lack adequate cooling or are poorly maintained, or if they are less likely to use available utilities because of the cost. Homeless persons are at very high risk for an adverse health outcome because of their unprotected exposure to extreme temperatures and lack of resources to limit their exposure or seek medical care if needed.
- **Social isolation:** Socially isolated individuals are less likely to recognize symptoms of excessive heat exposure. This can delay or prevent treatment and result in more serious health outcomes. Members of this group, which includes the homeless and those living alone, may also be less willing or able to reach out to others for help.

The City of Santa Ana has a substantial homeless population, who are likely to possess several or many of these risk factors. The City also has a substantial stock of older homes that may not have been built or maintained to current building code standards, providing less protection from high temperatures. The City may also have a number of detached garages or other outbuildings that were not built to be residences but have been converted (perhaps illegally) into residences; these may lack adequate ventilation or cooling systems to protect the occupants from high heat.

Virtually all residences in Santa Ana with air conditioning rely on electricity for cooling. Power outages or interruptions in natural gas service or supply to power plants that occur during high temperatures may affect people's ability to cool their homes.

Figure 60 Heat Disorders by Temperature Exposure

Heat Index	Category	Possible Heat Disorders in Vulnerable or Exposed Populations
130° F	Excessive Danger	Heatstroke risk excessively high with continued exposure.
105° - 129°F	Danger	Sunstroke, heat cramps and heat exhaustion likely, heatstroke possible with prolonged exposure and/or physical activity.
90° - 105°F	Excessive Caution	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
80° - 90°F	Caution	Fatigue possible with prolonged exposure and/or physical activity.

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Heat Illness and Injury

Medical Condition	Symptoms	Responses
Heat Cramps	Painful muscle cramps and spasms, usually in muscles of abdomen, arms and legs. Heavy sweating.	Gently stretch and massage affected muscle groups. Stop all activity and sit in a cool place. Drink clear juice or a sports beverage. Consult with a clinician or physician if individual has cardiac problems or cramps do not subside within one hour.
Heat Syncope (Fainting)	Skin moist and cool. Light-headedness, dizziness, fainting.	Sit or lie down in a cool place. Slowly drink water, clear juice, or a sports beverage.
Heat Exhaustion	Heavy sweating, weakness, skin is cool, pale, and clammy. Rapid but weak pulse. Normal temperature possible. Possible muscle cramps, dizziness, fainting, headache, fatigue, nausea, and vomiting.	Move individual out of sun and into shady or air-conditioned location. Lay him or her down, elevate legs, and loosen or remove clothing. Apply cool, wet cloths or use mister and fan. Give sips of cool water or other non-alcoholic beverage without caffeine. Seek medical attention if symptoms worsen or last longer than one hour. Monitor carefully, as can quickly progress to heat stroke.
Heat Stroke (Sunstroke)	Altered mental state—irritable, personality changes. Rapid heartbeat. Rapid shallow breathing. Possible throbbing headache, confusion, nausea, and dizziness. High body temperature (> 104°F). Rapid and strong pulse possible. Possible unconsciousness. Skin may be hot and dry due to lack of sweating, or moist if caused by exertion.	Heat stroke is a medical emergency. Summon emergency medical assistance or get the individual to a hospital immediately. Delay can be fatal. Move individual to a cooler, preferably air-conditioned, environment. Reduce body temperature with a water mister, covering with cool sheets or sponging. Use air conditioners. Use fans if heat index temperatures are below the high 90s. Remove clothing. If temperature rises again, repeat process. Offer cool water or other non-alcoholic beverage without caffeine.

Animals - Hot weather affects animals just as it affects people. Exposure to high temperatures can cause serious illness, injury or death to animals. Dogs and cats have a normal body temperature of 101.5 degrees (plus or minus 1 degree). Dogs and cats are designed to conserve heat and are less efficient at cooling than humans. Any time a dog or cat's body temperature rises above 105 degrees, they are in danger of heat stroke.

Animal's sweat glands are located on the nose and footpads, which are inadequate for cooling on hot days. Panting and drinking water help cooling, but if the air temperature is overheated, brain and other organ damage can occur in 15 minutes.

Animals left inside a vehicle on hot days constitute a life-threatening emergency to the animal. A car with windows rolled down slightly, combined with windows collecting light, will trap heat inside and create a pressure cooker effect. With an outside air temperature of 85 degrees, after 10 minutes the inside car temperature will rise to 102 degrees and will rise to 120 degrees after 30 minutes.

Extreme Cold - Climate and History

The City of Santa Ana, like most of southern California, experiences a generally moderate climate and stable weather patterns. Extreme cold temperatures are rare, but do occur and can pose a threat to populations in the City.

The NWS Weather Station located in Santa Ana at Orange County Fire Authority Station 75 (former Santa Ana Fire Department Station 5) has been recording weather data for more than a century. Wintertime low temperatures in the City usually average in the mid to low 50 degrees. Additionally, in the last 100 years (since 1916), the Santa Ana weather station has recorded temperatures below 32 degrees in 37 of those years, and temperatures below 40 degrees in 82 of those years.

The most life-threatening consequence of cold temperatures is hypothermia, which is usually associated with extreme cold temperatures. However, even temperatures in this mid-50’s range can result in hypothermia for some populations. These include persons without adequate shelter (homeless, persons in sub-standard housing, persons who cannot afford to pay utility bills) or persons with specific risk factors or vulnerabilities (described below). Exposure to wind or rain can also magnify the chilling effect of moderately cold temperatures.

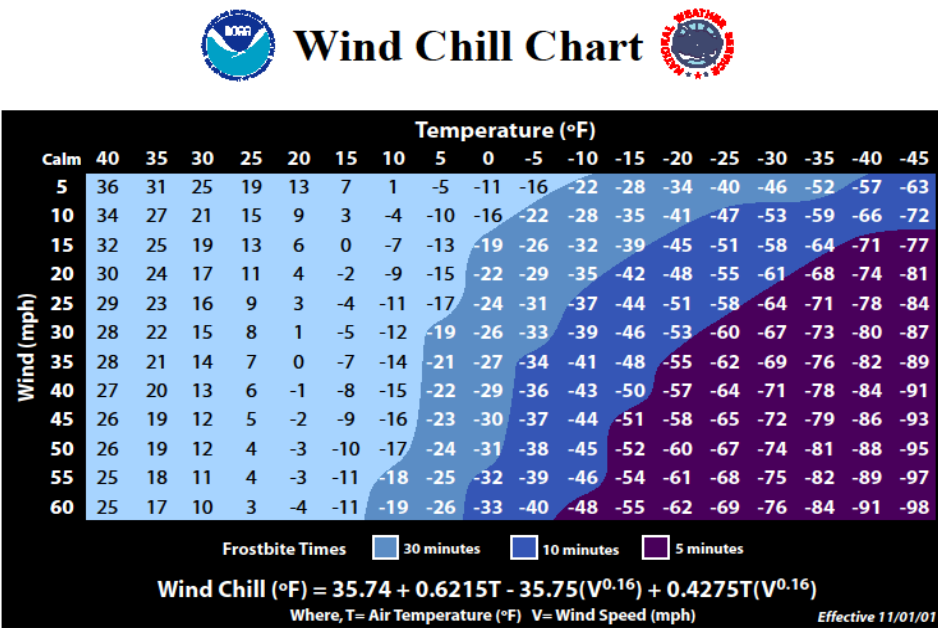
National Weather Service Products and Information

The National Weather Service defines an Excessive Cold Event based on temperature, wind chill and microclimate factors. The NWS issues a variety of Cold Weather notices when temperatures are forecast to be unusually cold. The guidelines for these notices in Orange County utilize the same Forecast zones defined above, and are:

- A **Frost Advisory** is issued when minimum temperature is forecast to be 33-36 degrees on clear, calm nights.
- A **Freeze Watch** indicates conditions are favorable in the next 12 to 48 hours for a freeze event that meets or exceeds the Freeze Warning criteria.
- A **Freeze Warning** is issued anytime minimum temperature is expected to be 28-32 degrees for a minimum of two consecutive hours at two or more locations within the zone.
- A **Hard Freeze Warning** is issued any time minimum temperature is expected to drop below 28 degrees for a minimum of two consecutive hours at two or more locations within the zone.

When coupled with rain or wind, which cause the body to lose heat more quickly, even moderately low temperatures can pose significant health risks. One of the gravest dangers of winter weather is wind chill. The wind chill is based on the rate of heat loss from exposed skin by the combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature.

Figure 62 Wind Chill Chart



Cold Vulnerabilities and Risk Factors

Some populations pose an additional challenge in that people can be affected by cold more quickly or more severely based on other underlying factors, including age, health and lifestyle choices or circumstances. Individuals possessing any combination of the following characteristics or conditions are at greater risk for experiencing a serious, temperature-attributable illness or injury:

- **Age and underlying conditions:** This at-risk group includes infants and people 65 and older who may be more susceptible to the effects of extreme cold due to their physiology and state of health, or who may be unable to express signs or recognizable symptoms of cold exposure. It includes people with underlying medical conditions (e.g., heart disease, diabetes, asthma, malnutrition, substance abuse) that may be exacerbated during extreme cold.
- **Cognitive impairments:** People with mental illnesses, with cognitive disorders, or under the influence of drugs or alcohol may be unable to make rational decisions that would help limit their exposure to excessive cold or to recognize symptoms of excessive cold exposure. In addition to impairing judgment, alcohol, sedatives and other legal or illegal medications or controlled substances may impair the body's ability to generate or maintain body heat.
- **Mobility constraints:** People with mobility constraints are at higher risk during extreme cold if the constraints limit their ability to access appropriately heated locations. This group includes the very young, the elderly, the very obese, the bedridden, and those with other access and functional needs that may affect mobility.
- **Economic constraints:** The poor may be disproportionately at risk during extreme cold if their homes lack adequate heating or are poorly maintained, or if they are less likely to use available utilities because of the cost. Homeless persons are at very high risk for an adverse health outcome because of their unprotected exposure to extreme temperatures and lack of resources to limit their exposure or seek medical care if needed.
- **Social isolation:** Socially isolated individuals are less likely to recognize symptoms of cold exposure. This can delay or prevent treatment and result in more serious health outcomes. Members of this group, which includes the homeless and those living alone, may also be less willing or able to reach out to others for help.

The City of Santa Ana has a substantial homeless population, who are likely to possess several or many of these risk factors. The City has a substantial stock of older homes that may not have been built or maintained to current building code standards, providing less protection from cold temperatures. The City may also have a number of detached garages or other outbuildings that were not built to be residences but have been converted (perhaps illegally) into residences; these may lack adequate insulation or heating systems to protect the occupants from extreme cold.

Virtually all residences in Santa Ana rely on electricity or natural gas for heating. Power outages or interruptions in natural gas service or supply that occur during cold temperatures may impact people's ability to heat their home, resulting in far more people becoming susceptible to dangerous cold.

Hypothermia

Hypothermia occurs when a person's core body temperature (usually 98.6 degrees) falls below 95 degrees. The severity of the condition is defined by body temperature. A core temperature of 90-95 degrees is mild hypothermia, 82-90 degrees is moderate, and below 82 degrees is considered severe hypothermia.

Signs and symptoms of hypothermia include sensation of cold, shivering, exhaustion, poor coordination, slurred speech, drowsiness and confusion. In severe hypothermia, the victim may stop shivering as the body stops trying to create heat. People suffering hypothermia often have impaired judgment and cannot perceive their own need for shelter or medical care. Hypothermia can cause the heart, brain and kidneys to cease functioning and is a rapidly life-threatening condition.

Cold weather affects animals just as it affects people. Exposure to harsh conditions can cause serious illness, injury or death to animals. Animals are also affected by wind chill and rain. When the temperature drops below freezing, pets should not be left outside for extended periods.

2.4.4 Power Failure

Electric Power Supply

The City of Santa Ana receives its electrical power supply entirely from Southern California Edison (SCE). SCE is one of the nation's largest electrical utilities, supplying 15 million people over a 50,000 square mile service area, covering 180 cities throughout 15 of California's southern, central and coastal counties. SCE covers almost all of Orange County, except for the southern end of the county (roughly south of Alicia Parkway) which is covered by San Diego Gas & Electric, and the City of Anaheim, which operates its own city power utility.

The Power Content Label is a document produced by the California Energy Commission (<http://www.energy.ca.gov/pcl/>) which lists the sources of each electrical provider's power supply. The 2020 Power Content Label for SCE indicates that SCE acquires its supply of electricity from three major sources and two minor sources:

- 42% purchases or transfers from other power utilities throughout the western United States
- 30.9% renewable generation (15.1% solar, 9.4% wind, 5.5% geothermal, 0.1% biomass, 0.8% other hydro)
- 15.2% natural gas generation
- 8.4% nuclear power generation
- 3.3% large hydroelectric power generation

Electricity cannot be stored effectively in large quantities, therefore it must be generated, distributed and used in real time; supply must always be produced to meet the current demand. California electric utilities are part of an interconnected electrical grid throughout the western United States and participate in the Western Systems Coordinating Council, which coordinates the activities and establishes the reserve requirements for power supply for the entire western United States.

The California Independent System Operator (CA ISO) is a quasi-governmental agency established by the State Legislature to ensure demand for power is met and to provide for adequate reserves in California. CA ISO acts as a monitor for the electrical grid in the state, to observe for power supply shortfalls, to coordinate the sharing of available power supply among utilities and to provide warning when the power supply may fail.

Types and Causes of Power Outages

Some power outages may be planned events or very minor in scope and would not be considered emergencies, although they may represent a significant inconvenience to the community. These include **Maintenance Outages**, which occur quite often as SCE performs system maintenance or upgrades their electrical infrastructure. Maintenance outages are limited to a small neighborhood or a few customers at a time, are short in duration (usually several minutes to several hours) and are scheduled ahead of time and affected customers are notified beforehand. **Repair Outages** also occur frequently as a result of minor accidents such as damage from vehicle crashes, wind or storm damage to infrastructure, debris contacting power lines, or equipment failures such as transformer fires. Repair outages are also usually limited to a small neighborhood or a few customers at a time and usually short in duration (several minutes to several hours), but are not scheduled ahead of time and customers do not receive notification until after the power is out.

Other outages may constitute a public safety emergency or a significant disruption and loss to the community. These may be caused by extreme heat; damage or fear of damage to power generating or distribution equipment caused by wind, storms, lightening or wildfires; or intentional damage, sabotage or cyber-hacking of the electrical grid. These include Electrical Demand Emergencies, Public Safety Power Shutoffs, Electrical Transmission Emergencies, and Large Scale, Widespread Power Outages.

Electrical Demand Emergencies (and **Rotating Outages**) occur when a shortfall in the electrical operating reserve (the available power supply) is forecast or expected to occur. This means electric consumers may be consuming more power than the electrical grid can supply. This most commonly occurs during periods of extreme heat, when homes, businesses and other facilities are operating air conditioning, fans and refrigeration units at maximum capacity, placing extreme demand on the power supply. Failure or maintenance operations on electrical

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generating equipment may also reduce the available supply, and there may be a combination of reduced supply during a time of extreme demand.

CA ISO will classify power shortage emergencies into Stages and will deliver various Alerts and Warnings to government agencies and to the public based on the timing and severity of the forecasted shortfall. However, it must be noted, if there is a rapid or unanticipated spike in demand or loss of supply, CA ISO may not have time to deliver these warnings before outages occur, or may advance rapidly through stages or skip stages altogether.

CA ISO Alerts and Warnings	
ISO Notice	Condition
Flex Alert	Less than 7% operating reserve is forecast in the next 24 hours
Warning	Less than 7% operating reserve is forecast in the next 1 hour
Energy Emergency Alert 1 (Stage 1 Emergency)	Less than 7% operating reserve is occurring
Energy Emergency Alert 2 (Stage 2 Emergency)	Less than 5% operating reserve is occurring
Energy Emergency Alert 3 (Stage 3 Emergency)	Less than 3% operating reserve is occurring

Flex Alert – A Flex Alert is issued when the operating reserve is forecast to fall below 7% in the next 24 hours. This means consumers will be using more than 93% of the power that utilities are capable of producing. A Flex Alert is an urgent call to consumers to immediately begin to conserve electricity and to shift demand to off-peak hours (off-peak hours are after 6:00 PM, when most energy-consuming offices, schools, businesses and industries have closed for the day and outside temperatures are beginning to cool). Flex Alert is a public awareness and emergency alert program funded by the utilities and initiated by CA ISO. CA ISO will notify all news media outlets (TV, radio, print and online) and begin airing television and radio ads and social media posts encouraging consumers to begin conserving electricity, while there is still time to avoid outages. Consumers are asked to minimize or postpone to off-peak hours use of air conditioning, fans, lighting and any other electrical appliances and to minimize water use, as water utilities consume electricity to deliver water.

Warning - A Warning is issued when operating reserves are forecast to fall below 7% in the next 1 hour. A Warning is not a new stage, it is a notification that the Flex Alert is not yet working and Emergency Stages are imminent.

Energy Emergency Alert 1– An Energy Emergency Alert 1 (also called Stage 1 Emergency) is declared when operating reserves have fallen below 7% (consumers are currently using more than 93% of available supply). At this time, CA ISO will raise the conservation messaging to consumers to a more assertive level, with more prominent radio and TV ads and may utilize news crawls at the bottom of TV screens or activate Emergency Alert System broadcasts to break into regularly scheduled TV and radio programs. The City may utilize the AlertOC mass notification system to directly notify our residents and businesses. An Energy Emergency Alert 1 is a notification that power outages are imminent.

Energy Emergency Alert 2 - An Energy Emergency Alert 2 (also called Stage 2 Emergency) is declared when operating reserves have fallen below 5%. Stage 2 Emergencies continue the assertive public messaging of Flex Alerts and Energy Emergency Alert 1's. Utilities will begin shutting off electricity to large businesses who have volunteered for this in exchange for rebates on their electricity bill. Programs for homeowners who have volunteered to have their air conditioning curtailed in exchange for rebates will also be activated. Electric utilities will begin drawing increased power supply away from other utilities throughout the western United States to bolster supply here, which may require conservation measures to begin in those other regions.

Energy Emergency Alert 3 - An Energy Emergency Alert 3 (also called Stage 3 Emergency) is declared when operating reserves have fallen below 3%. Electricity customers pre-identified as large consumers, such as factories or heavy machinery operators, will be shut down involuntarily. Rotating power outages will begin within one hour if power supply does not stabilize rapidly.

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Rotating Outages – Rotating outages are a last resort measure used by electric utilities to avoid a total blackout of the power grid, when all attempts at power conservation and increasing the power supply have fallen short and demand is still exceeding supply. During rotating outages, electricity to individual circuits will be intentionally shut off for a specific time period, usually 1 to 2 hours at a time. The individual circuits turned off will be geographically dispersed throughout the region, to ensure that power outages are not concentrated in one area at a time, which could lead to looting, widespread traffic jams or other problems in the blacked-out area. Circuits supplying Essential Use Facilities, like police and fire stations, jails and hospitals, are pre-identified and exempted from intentional blackout.

SCE has pre-identified their rotating outage areas by groups and maintains maps identifying these service areas. These maps are available on the “Outage Center” page of SCE’s website www.sce.com, and customers can find their outage group on the front page of their monthly electricity bill. If, after the first blackout period, demand still exceeds supply, the blackout will rotate to the next pre-identified circuits. Thus, the outage “rotates” until sufficient power supply is restored. It is important to note that every outage group, and therefore every rotation, does include some portion of the City of Santa Ana. As the power supply stabilizes, the emergency may be over or CA ISO may step back down to Flex Alert, Energy Emergency Alert 1 or 2 status.

Public Safety Power Shutoffs (PSPS)

Public Safety Power Shutoffs are the de-energizing of selected distribution circuits that traverse High Fire Risk areas during extreme weather, such as high winds, to prevent downed or damaged power lines from igniting wildfires. SCE and other utilities, upon receiving or formulating weather forecasts, will attempt to predict the lines most at risk for damage and wildfire ignition, and will preemptively de-energize those circuits for periods of hours or days, until the damage and wildfire ignition threat has abated.

SCE’s process for Public Safety Power Shutoffs:

4-7 Days Ahead - When forecasts indicate extreme fire conditions, SCE will begin predictive modeling to assess potential impact.

4 Days Ahead - SCE monitors fire weather watch alerts from the National Weather Service and continues to refine predictive models. Incident responders are placed on alert.

2 Days Ahead - Extreme fire conditions forecasted. Coordinate with the emergency management community, first responders and local government first. Initiate customer notifications on possible PSPS. First notification sent to customers.

1 Day Ahead - Extreme fire conditions imminent; continue to coordinate with emergency management community, first responders, local government, and customers of possible PSPS. Second notification sent to customers.

During: Power Is Shut Off - Extreme fire conditions validated by field resources, notify the emergency management community, first responders, local government, and customers to power shutoff. Note that an erratic or sudden onset of conditions may impact the ability to provide advanced notice to customers. Third notification sent to customers.

After: Power Is Restored - Extreme fire conditions subside to safe levels; field resources perform inspections and patrols of equipment, then power is restored to affected communities; notification sent to impacted parties. Fourth notification sent to customers.

The City of Santa Ana does not lie in a High Fire Risk Area and is not believed to receive power from any distribution circuits likely to be de-energized during PSPS events, however, some distribution circuits do lie close to the City and the circuit coverage maps are not always exact.

Electrical Transmission Emergencies

While Demand Emergencies occur when demand for electricity exceeds the available supply, Transmission Emergencies occur as a result of overloads or accidental or intentional damage or losses to local transmission

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equipment, preventing the power supply from reaching the consumer. In these low-voltage conditions, substations will shut down automatically in order to prevent further system damage.

Utility regulations require SCE to have plans in place to mitigate grid reliability impacts. With the de-commissioning of the San Onofre Nuclear Generating Station, which previously delivered much of the power supply to Orange County, the local transmission system may not be able to deliver high loads and support high voltage demands. SCE has an Under-Voltage Load Shedding (UVLS) system in place for this. If low voltage levels are automatically detected, load shedding is automatically triggered and will occur without notice.

SCE has four substations that may experience load shedding, which supply 35 cities or unincorporated jurisdictions throughout central and southern Orange County. These four substations are the Johanna, Ellis, Viejo and Santiago substations. The Energy/Power Failure Annex to this Plan shows the geographic boundaries and impacted communities and customers for each. Load shedding would likely occur in that order (Johanna, Ellis, Viejo, and Santiago) and would occur cumulatively, each phase darkening another substation until transmission reliability is restored. The City of Santa Ana is included in the Johanna (southeastern Santa Ana) and Ellis (western Santa Ana) substations.

Large Scale, Widespread Power Outages

Large scale, widespread power outages are rare and unlikely but are a worst-case scenario for power outages. These may be caused by weather-related damage or accidental or intentional damage to generating or transmission equipment. This may originate as an imbalance in the electrical grid that triggers a cascading power failure on a regional or multi-state basis, as more and more circuits are damaged or protective devices trigger automatic shutdowns. It may take considerable time to diagnose the cause, separate out undamaged circuits, repair damaged equipment and then to re-start generation from a cold, “black start” condition. This may cause widespread power outages to last for several hours to several days. The greater the portion of the grid effected, the longer it will take to resume operations.

Impacts of Power Outages

Any widespread power outage may constitute an emergency in itself. A prolonged power outage may affect people with disabilities or access and functional needs and those who rely on power for life-sustaining medical equipment, such as oxygen or respirators. Some life-saving medications require refrigeration. The very young or older persons and persons with underlying medical conditions may be at risk in high or low temperatures without access to air conditioning or heating. Hospitals, skilled nursing facilities and assisted living facilities may be unable to provide for their patients and residents.

This may result in a surge of 911 calls for paramedics and a surge of patients into hospitals. Cooling or heating centers, places where individuals can go to escape heat or cold, may need to be activated in schools, community centers or businesses that have power or backup generators. 911 and other dispatch centers may become overloaded with multiple calls from the public. Individuals with electricity-dependent phones (cordless phones or cable/internet-based phone service) may not be able to call 911 or otherwise communicate by phone. Infrastructure that powers telephone, cell phone and internet communications may fail, causing those systems to stop working altogether. In addition to preventing people from calling for help, public safety agencies will be unable to distribute emergency warnings or information to the public.

Prolonged power outages will affect critical, power-dependent infrastructure, including traffic signals and other traffic safety devices, and prevent water and sewer systems from delivering water for consumption or firefighting and removing sewage waste. Gas stations will not have power to pump gas, impeding vehicle travel, and facilities utilizing backup generators may begin to run out of fuel and be unable to re-supply when transportation and distribution systems are without power. The fuel distributors who are able to operate will quickly exhaust their supplies. This may require police and fire stations, 911 answering points, EOCs, jails, hospitals and nursing facilities and other critical facilities to function without electricity.

Other essential businesses, like pharmacies, grocery stores and financial institutions may be unable to operate, preventing residents from obtaining critical supplies, and businesses may lose millions of dollars in lost revenue or perishable products.

Historical Power Outages

On January 17, 2001, CA ISO declared a Stage 3 Emergency as a result of the California energy crisis caused by deregulation, manipulations and price-fixing in the power supply market (the Enron scandal). Rotating outages were instituted around the San Francisco Bay Area by Pacific Gas & Electric, affecting several hundred thousand energy consumers, and these were repeated again the following day. On March 19 and 20, expanded rotating outages affected 1.5 million consumers throughout the state.

On August 14, 2003, on a very hot afternoon, several sagging power lines in northern Ohio came into contact with tree branches and shut down. This would normally trigger an alarm system and action by electrical operators, but the alarm system failed. As a result, more and more electricity was surging into smaller and smaller portions of the grid, triggering a cascade of failures and circuit shutdowns. The blackout eventually became the second largest power outage in history, cascading through eight northeastern and Midwestern states and Ontario, Canada, affecting 45 million Americans and 10 million Canadians. Thousands of people were stranded by the shutdown of mass transit operators, thousands more had to be rescued from elevators and underground subway trains, airline flights throughout the nation were cancelled or delayed due to airport shutdowns in the affected region, and many persons required medical treatment for heat-related illnesses. Some power was restored by 11:00 PM but many were left without power until the next morning.

On the afternoon of September 8, 2011, human error in an Arizona power plant triggered an 11-minute disturbance on five separate power grids throughout the southwest, leading to cascading outages throughout Arizona, southern California (including the SDG & E service area in southern Orange County) and western Mexico and affecting nearly 7 million customers for up to 12 hours. The outage occurred near rush hour on a hot day, snarling traffic throughout the region for hours. Schools and businesses closed and millions went without air conditioning on a hot afternoon. Hundreds of motorists stranded in traffic began to run out of gas and gas stations could not pump gas without power. Water and sewage stations lost power, disrupting water supply and causing sewage spills, unsafe drinking water and beach closures.

2.4.5 Storm/Flood

Factors Creating Flood Risk

Flooding occurs when weather rainstorms, geology, and hydrology combine to create conditions of water flowing outside its usual course.

Seasonal Rainfall

Over the last century, the average annual rainfall in Orange County has been just over 13 inches, slightly under 13 inches for the City of Santa Ana. However, the term “average” means very little as the annual rainfall during this period has ranged from 2.19 inches in 2006-07 to 38.2 inches in 1883-84 and 32.14 inches in 1940-41. This makes Orange County a land of extremes in terms of annual precipitation. A regular source for heavy rainfall is from tropical storms, which often coincide with El Niño years.

Atmospheric Rivers (See Figure below)

Atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. While atmospheric rivers can vary greatly in size and strength, the average atmospheric river carries an amount of water roughly equivalent to the average flow of water at the mouth of the Mississippi River. Exceptionally strong atmospheric rivers can transport up to 15 times that amount. When the atmospheric rivers make landfall, they often release this water in the form of rain or snow.

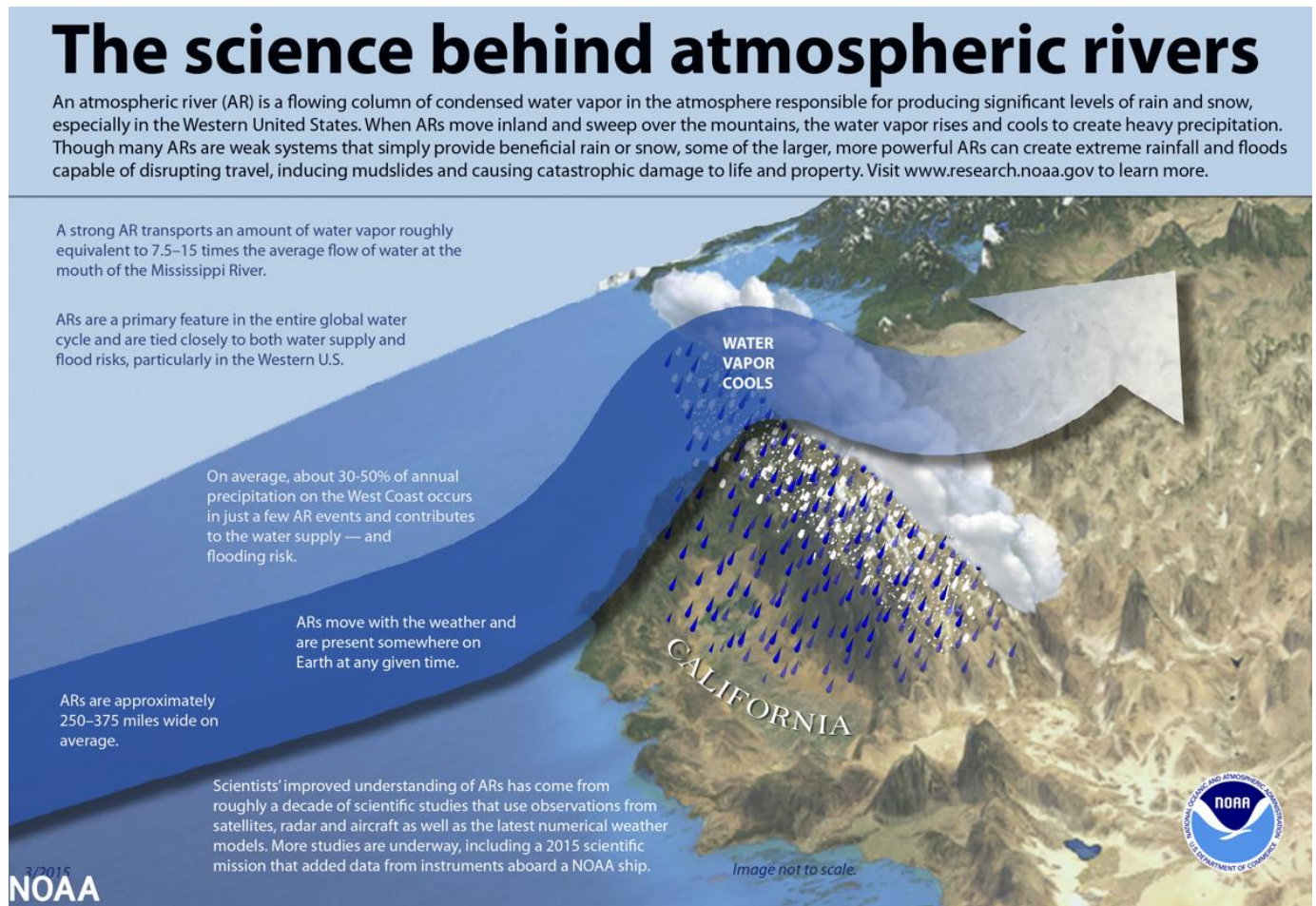
Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.

Not all atmospheric rivers cause damage; most are weak systems that often provide beneficial rain or snow that is crucial to the water supply. Atmospheric rivers are a key feature in the global water cycle and are closely tied to both water supply and flood risks, particularly in the western United States. A series of atmospheric rivers fueled strong winter storms that battered the U.S. West Coast from western Washington to southern California in December 2010, and again from January through March 2023, producing 11 to 25 inches of rain in certain areas.

Tornados

Although damaging tornados are very uncommon in Orange County, they are a possible factor associated with severe thunderstorms. Tornados are spawned when there is warm, moist air near the ground, cool air aloft, and winds that speed up and change direction, creating a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornados are capable of tremendous destruction with wind speeds of 250 mph or more and damage paths can be in excess of one mile wide and 50 miles long, but tornados occurring locally are generally weak and short-lived in comparison to larger tornado events occurring in other parts of the country.

Figure 70: Atmospheric Rivers



Geography and Geology

Orange County's 510,000 acres are mainly mountainous terrain from the northeast to the southeast and floodplain in the central and western section. These high mountains to the east and north of the County trap eastern-moving winter storms and prolong the rainfall. Some mountain peaks in Orange County receive more than forty inches of precipitation annually. The rainwater moves rapidly down the steep slopes and across the coastal plains on its way to the ocean. The County's rapid growth and transformation from an agricultural community to an urban community has changed flood control from containing large flows from the mountains and hills, to control of additional runoff produced by development of the plains. Although there is a countywide system of flood control facilities, the majority of these are inadequate for conveying runoff from major storms.

Essentially all of the City of Santa Ana and most of Orange County is built out leaving little open land to absorb rainfall. The lack of open land forces water to remain on the surface and rapidly accumulate. In-fill building is a common practice in many areas. Developers tear down an older home, replacing the home with a larger structure covering more of the lot.

Another potential source of flooding is "asphalt creep." The street space between the curbs of a street is a part of the flood control system. When water leaves property and accumulates in the street, it is directed toward the storm drain system. The carrying capacity of the street is determined by the width of the street and the height of the curbs along the street. Often, when resurfacing streets, a one to two-inch layer of asphalt is laid over the existing asphalt. This added layer of asphalt subtracts from the design capacity of the street to carry water. Thus, the original engineered capacity of the entire storm drain system is marginally reduced over time.

Identification of Flood-Prone Areas

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The National Flood Insurance Program (NFIP) was established in 1968 to provide flood insurance to the nation's flood-prone communities. A Flood Insurance Rate Map (FIRM) is the official map produced by FEMA delineating Special Flood Hazard Areas (SFHA) in communities where NFIP regulations apply, and these provide assessments of the probability of flooding in a specific location. FIRMs are developed by combining water surface elevations with topographic data. Information derived through this process illustrates areas with the potential for inundation during a 100-year or 500-year flood.

100-Year/500 Year Floods

A 100-year flooding event is a flood having a 1% chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. Similarly, a 500-year flood is a larger flood having a 0.2 % chance of occurring in any given year. The 100-year or 500-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year or 500-year flood. The Figures below illustrate these floodplains in Orange County and the City.

Figure 71: 100-Year and 500 Year Floodplains in Orange County

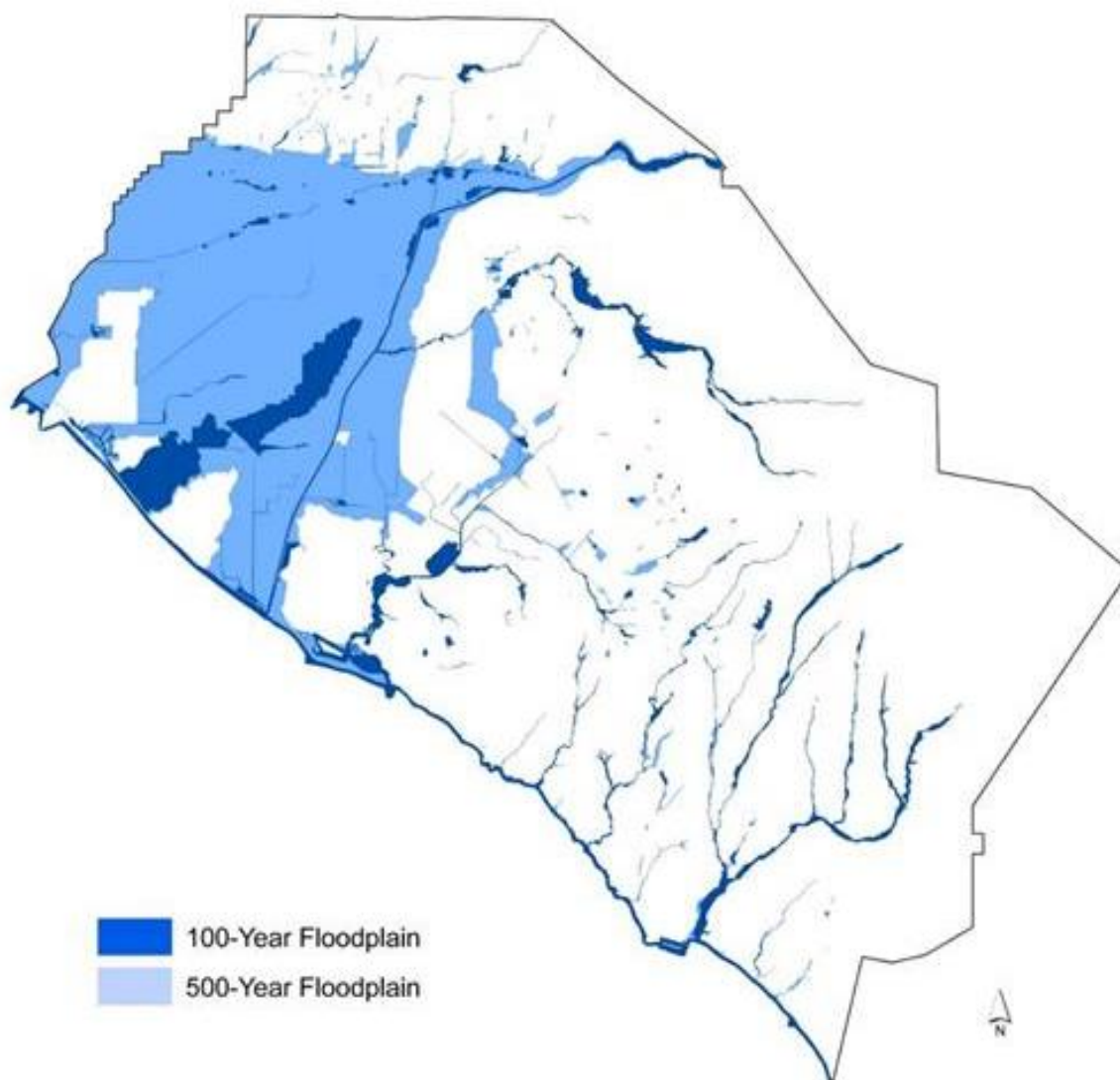
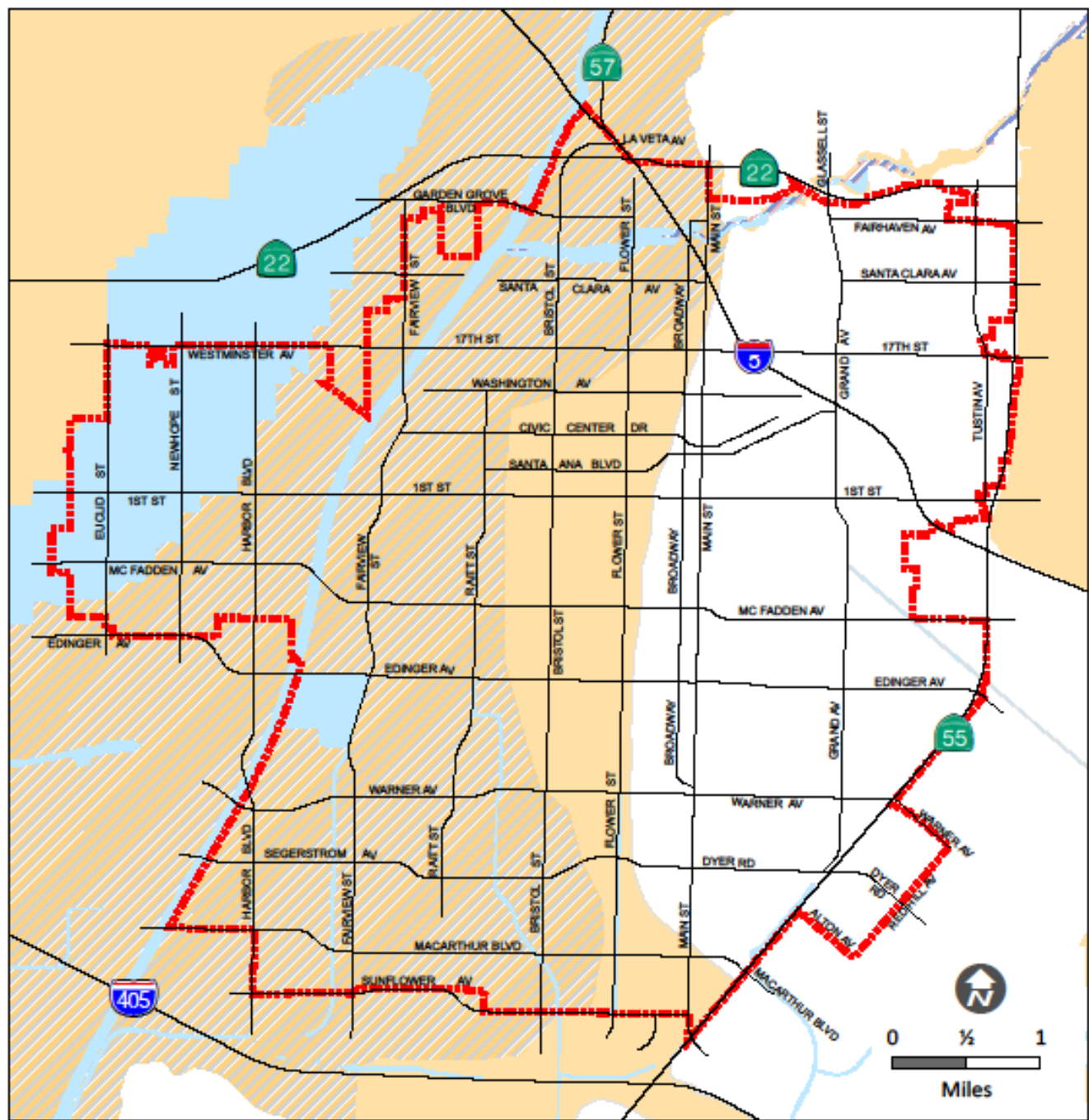







Figure 72 FEMA 100 and 500-Year Floodplains for Santa Ana



Legend

Flood Hazard Zones

-  AREA OF MINIMAL FLOOD HAZARD
-  0.2 PCT ANNUAL CHANCE FLOOD HAZARD
-  1% ANNUAL CHANCE FLOOD HAZARD
-  AREA WITH REDUCED FLOOD RISK DUE TO LEVEE
-  REGULATORY FLOODWAY



**FEMA Flood
Hazard Zones 2018**

Characteristics of Flooding

Two types of flooding primarily affect the Orange County region: Riverine flooding and urban flooding. In addition, any low-lying area has the potential to flood. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's capability to remove it.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. This flooding typically results from large-scale weather systems generating prolonged rainfall over a wide geographic area. Flooding occurs in hundreds of smaller streams, which then drain into the major rivers. When the accumulated water exceeds the carrying capacity of the waterway, the water overflows out across the floodplain.

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly, peaking with violent force. Further, portions of the County not inundated by river overflow during a 100-year event could be subject to flooding from overflow of water drainage facilities currently inadequate for carrying the 100-year discharge.

Local Flood Hazard

The Santa Ana River, flowing through the City of Santa Ana to the Pacific Ocean, is Orange County's greatest flood threat. The River enters Orange County from the Prado Dam, just across the Riverside County line adjacent to the 91 Freeway. The Prado Dam collects rainfall from across a 700 square mile watershed. Additionally, Santiago Creek enters the northeastern corner of the City and flows west into the Santa Ana River. The Creek flows through the Villa Park Dam, which collects rainfall from across an 81 square mile watershed. Despite extensive efforts at flood control protection, it appears that portions of the City which would not be inundated by river overflow during a 100-year event could be subject to flooding from overflowing of storm drains and other water drainage infrastructure that are presently inadequate for carrying the 100-year discharge.

The East Garden Grove-Wintersburg Channel is one of the underlying channel systems of the Santa Ana River floodplain, which passes north-south through the west end of the City near the border with the City of Garden Grove. This drainage system does not have the capacity to contain a 100-year flood and the channel banks and levees become overtopped at several locations, causing recurring flooding in severe storms. Flood damages along this Channel affect residential, commercial, and industrial development within the cities of Santa Ana, Westminster, Garden Grove, Huntington Beach and Fountain Valley.

The East Garden Grove-Wintersburg Channel was constructed in the early 1960s as a mixture of earthen, riprap, and concrete-lined trapezoidal sections with short reaches of concrete rectangular and covered box facilities. It was designed to carry 25-year peak discharge which was the design standard at the time the channels were constructed. With urbanization growth throughout Orange County, the existing capacity has become deficient and needs to be improved to convey a 100-year peak discharge. The hundreds of homes in the downstream segment of the channel system could be subjected to an estimated 8-foot depth of flooding if a 100-year storm event occurred today. The winter storms of 2005 in this area severely eroded the maintenance roads and levee banks. Today, this Channel is considered Orange County's most flood-prone location.

Other flood control channels within the City of Santa Ana and subject to flooding during severe storms include the Greenville-Banning, Santa Ana-Delhi, Santa Ana-Santa Fe, Santa Ana Gardens, Southwest Tustin, and Lane Channels.

Flood History

The infrequency of very large floods further obscures the County's flood hazard. For some particularly disastrous storms, a false sense of security prevailed following long periods of mild or semi-arid years.

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Damaging floods caused by the Santa Ana River, known as “Great Floods,” appear in records as early as 1770, when a massive flood was recorded in the notes of Father John Crespi on January 7, 1770. Major floods in Orange County on the Santa Ana River have occurred in 1810, 1815, 1825, 1884, 1891, 1916, 1927, 1938, 1969, 1983, 1993 and 1997. The greatest flood in terms of water flow in the Santa Ana River was in 1862 with an estimated flow rate of 317,000 cubic feet per second (cfs). This was three times greater than the Great Flood of 1938, estimated at 110,000 cfs. An average flow on the Santa Ana River today usually amounts to a cfs in the low 1,000’s. The most damaging in terms of cost was the Great Flood of 1969. The County’s population and development had significantly increased by then, creating greater potential for loss.

Great Flood of 1862- The storm and flood of January 1862, called the Noachian deluge of California, were unusual in two ways: 1) the storm occurred during the very severe drought of 1856-1864 and 2) the flooding was extremely long, lasting 20 days. Under normal circumstances, major floods last no longer than a few days.

Great Flood of 1916 – The flood on January 27, 1916 inundated a large area in Santa Ana, flooding Main Street with water 3 feet deep. The farming area, today the City of Westminster, was also flooded. A total of six bridges, three traffic bridges and three railroad bridges, washed away and four people drowned.

Great Flood of 1938 – The flood of 1938 was considered the most devastating of all Orange County floods in the 20th Century and affected all of Southern California. The storm began on February 27 and lasted until March 3. Anaheim, Santa Ana, and Garden Grove were hardest hit. In the Santa Ana Basin, 34 people died and 182,300 acres were flooded. Two major railroad bridges, seven traffic bridges, and the small town of Atwood (now part of the City of Placentia) were destroyed. As the Santa Ana River inundated the northwestern portion of Orange County, train service to and from Santa Ana was cancelled and communication with the outside world was essentially nonexistent. Damage exceeded \$50 million. The flood and its damage were a catalyst for construction of Prado Dam, developed as part of the Army Corps of Engineers flood control protection plan. Government officials estimate that today without the protection of Prado Dam, a flood of this magnitude would cause as many as 3,000 deaths and top \$40 billion in damages.

Great Flood of 1969 – The floods of January-February 1969 were the most destructive on record in Orange County. Previous floods had greater potential for destruction, but the County was then relatively undeveloped. A drought that began in 1945 was relieved by only two wet years until the floods in 1969. Rainfall was continuous from January 18 to January 25, resulting in widespread flooding on January 25-26. Orange County was declared a national disaster area on February 5. A second storm system from February 21 to 25 once again brought rain to the already saturated ground, culminating in a disastrous flood on February 25.

The largest peak outflow from Santiago Reservoir since its inception in 1933 occurred in February. On February 25, the reservoir at Villa Park Dam reached its capacity for the first time since its construction in 1963. Even though the outlet was discharging up to 4,000 cfs, spillway overflow occurred at 1:30 p.m. on February 25 and continued for 36 hours, reaching a maximum peak outflow from the dam of 6,000 cfs. The safety of the dam was never threatened. However, the outflow into Santiago Creek caused serious erosion downstream in Orange and Santa Ana and in portions of parks and golf courses. Trees and debris inundated the streambed. Houses, apartments, gardens, swimming pools, and bridges eroded away. Numerous residents and volunteers worked around the clock to remove debris, sandbag eroding embankments, cordon off danger zones, issue warnings, and make temporary repairs. U.S. Marine Corps helicopters dropped junked cars along the banks of the creek below Bristol Street in an effort to prevent further undermining of homes. A Southern Pacific Railroad bridge, water and sewer lines, a pedestrian overcrossing, and three roads washed out. Approximately 2,000 Orange and Santa Ana residents were evacuated from houses bordering Santiago Creek.

Great Flood of 1983 – The presence of El Nino spawned the flood of 1983. The intense downpour concentrated in a local area and resulted in the highest waves to crest onshore in 10 years. Meanwhile, the Santa Ana River crested at the mouth of the ocean, creating a disaster for the low-lying areas of Huntington Beach with floodwaters three to five feet deep. In addition, the pounding surf destroyed a section of the Huntington Beach Pier, resulting in a complete renovation of the pier.

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Great Floods of 1993 – In 1993, El Nino spawned a storm and flood. This storm was concentrated in the Laguna Canyon Channel area from Lake Forest to downtown Laguna Beach. In spite of a valiant effort to save downtown merchants by sandbagging, the stores were flooded anyway. Laguna Canyon Road was damaged extensively as well as homes and small businesses in the Laguna Canyon Channel. There were no fatalities reported.

El Nino of 1997-98

Flooding during the 1997/1998 El Niño Storm Season affected Orange County. Extensive storm damage to private property and public infrastructure throughout Orange County reached approximately \$50 million. Storm conditions caused numerous countywide mudflows, road closures, and channel erosion. High ocean waves and storm activity forced the closure of Aliso Beach Pier when it was declared unsafe to the public and as a result, eventually required demolition. The high ocean waves also severely damaged the Laguna Beach boardwalk. Flooding occurred in that city, causing injuries and two deaths as a result of water and mud flow. Lateral erosion occurred to the natural banks of Serrano Creek and Aliso Creek. Storm flows destroyed portions of San Juan Creek and Trabuco Creek levees and channel linings. Major landslides in Laguna Niguel caused millions of dollars in damage. Deterioration and collapse of a culvert 25 feet beneath the asphalt forced closure of Santiago Canyon Road for three weeks.

Although the 1997-98 floods resulted in substantial damage throughout Orange County, it was not unprecedented. In January 1995, a disaster was declared in the County as extremely heavy and intense rains quickly exceeded the storm runoff capacity of local drainage systems in many Orange County cities and regional Flood Control District systems. As a result, widespread flooding of homes and businesses occurred throughout these cities. There were approximately 1000 people evacuated and extensive damage sustained to both private and public property.

A series of storms battered Southern California in January and February 2005. These storms were the most significant to hit Southern California since the El Niño of 1998 and caused mudflows and flooding throughout Orange County. Both state proclamations and federal declarations of disaster were made for these storms.

Impacts of Flooding

The largest impact to communities in a flood event is the loss of life and property to both private and public entities. Development in the floodplains of Orange County increases the risk of extensive property loss resulting in flooding and flood damage.

Property Loss Resulting from Flooding Events

The type of property damage resulting from flood events is dependent upon the depth and velocity of the floodwaters. Fast moving floodwaters can wash buildings off their foundations and sweep cars downstream. High waters combined with flood debris can damage infrastructure, pipelines, and bridges. Landslide damage related to soil saturation can cause extensive damage. Water saturation of materials susceptible to loss (i.e., wood, insulation, wallboard, fabric, furnishings, floor coverings, and appliances), in many cases, renders a home unlivable.

Mobile Homes

Many older manufactured home parks are located in floodplain areas. A manufactured home has a lower level of structural stability during a flood event and may be washed off its anchoring.

Business/Industry

Flooding impacts businesses when damaged property interrupts operation, forcing closure for repairs, and customer access is cut off. A community maintains economic vitality in the face of flood damage with quick response to the needs of businesses affected by the flood. Response to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

Public Infrastructure

Publicly owned facilities are a key component of the daily lives of all residents in the county. Damage to public water and sewer systems, transportation networks, flood control facilities, emergency facilities, and offices hinder the government in delivering services. Drinking water supplies may become contaminated by rising floodwaters.

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Roads

During a flood, dependable road connections are critical for providing emergency services. City and County road systems often traverse floodplain and floodway areas. Federal, state, county, and city governments all have a stake in protecting roads from flood damage. Transportation agencies responsible for road maintenance are typically aware of roads at risk from flooding.

Bridges

In flood events, bridges are key points of concern because of their importance in the transportation network for the movement of goods, people, and emergency services. During flood events, scouring of bed material supporting their foundation can occur. Historically, this is the most common cause of bridge failures. Bridges in and of themselves are also obstructions in a watercourse, restricting flows and causing stream instability.

Storm Water Systems

Local drainage problems are common throughout the City and most of the storm drain system is owned and operated by the City. City Public Works staff is aware of local drainage threats. The problems are often present where storm water runoff enters culverts or goes underground into storm sewers, when rainfall exceeds the carrying capacity. Delayed maintenance or debris accumulating in the drainage system also contributes to the flood hazard in urban areas.

2.4.6 Dam/Reservoir Failure

A dam is defined as an artificial barrier to impound water for storage or control. A reservoir is defined as a large, usually artificial structure for the storage of water, or also may be defined as the body of water stored within the structure. Dam or reservoir failures can result from a number of natural or human-caused threats including earthquakes, erosion of the structure or foundation, rapidly rising water levels, structural or design defects, construction flaws, or acts of terrorism or sabotage.

Failures may result in sudden and rapid release of a large volume of water that inundates downstream or lower elevation areas. This surge of water can cause loss of life or serious injury through drowning or blunt force trauma; destruction of homes and buildings; large-scale evacuations and extended displacement of residents; destruction of roadways, railways and bridges; damage to flood control channels and drain systems; and damage to electricity, water, sewage, gas, phone and other utility equipment or distribution systems.

Unlike damage from an earthquake, which may cause widespread damage but leave many properties undamaged or lightly damaged, a surge of water from a dam failure will likely destroy or badly damage every property and structure in the inundation area. Substantial governmental response and recovery may be required and may continue for an extended time beyond the initial emergency response and rescue stage. These efforts may include clearing debris from roadways and public properties, inspecting structures and demolishing unsafe structures, rebuilding roadways and bridges, re-establishing public services and utilities, and providing continuing care and shelter to displaced persons.

Dam/Reservoir Failure Events - There have been a small number of failure events in southern California.

St. Francis Dam - The most destructive dam failure occurred on the St. Francis Dam near Santa Clarita in Los Angeles County. Almost as soon as the dam reached its fill capacity after construction, workers began to notice seepages and leaks. Just before midnight on March 12, 1928, a sudden and catastrophic failure of the dam sent 12.4 billion gallons of water, along with large concrete sections of the dam, surging down the Santa Clara River in a 120-foot high wall flowing at 18 mph. The water swept through the towns of Valencia, Newhall, Fillmore, Barsdale and Santa Paula and flowed all the way to the Pacific Ocean near the City of Ventura, 54 miles away. Approximately 450 persons were killed, with many bodies never recovered, and nearly 1,000 homes were destroyed. It was later determined that the dam was built on a poorly designed and constructed foundation, which could not support the weight and pressure of the dam and water.

Westminster Water Tank – On September 21, 1998, at 5:47am, a 5-million-gallon concrete aboveground water storage tank ruptured, sending a 6-foot high wave of water through a nearby fire station and the Hefley Square Townhomes in the City of Westminster. Six people were injured and 30 were left temporarily homeless after the wave gushed from the 22-foot high rupture in the tank. The fire station, 70 homes, 32 outbuildings, 2 businesses and 25 vehicles sustained damages or were destroyed. Gas, electric and telephone services were disrupted.



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Prado Dam Seepage - In January 2005, due to preceding storm activity that produced near-record water levels behind Prado Dam, the water surface elevation behind the dam peaked at 527.4 feet above sea level. On January 13, the U.S. Army Corps of Engineers (USACE) discovered seepage from the downstream face of Prado Dam. The seepage was located in an area that was under construction to build new outlet works as part of an overall flood control improvement to Prado Dam. As a precautionary measure, Corona city officials evacuated over 800 homes below the dam and Orange County officials relocated campers in the Canyon RV Park because of their proximity to the adjacent floodplain.

To decrease the amount of water behind Prado Dam, the release of water was increased from 5,000 cubic feet per second (cfs) to 10,000 cfs to reduce the level of water being held to 505 feet. In addition to the increase in water release, USACE began holding back floodwaters upstream at both the San Antonio Dam in Los Angeles County and Seven Oaks Dam near Redlands to reduce the inflow of water to Prado Dam. As the water level was lowered, the hydraulic pressure on the dam abutment subject to seepage was reduced. When the water was reduced to 505 feet on January 17, USACE was able to start the reconditioning of the dam in order to be ready for subsequent inflows to the dam.

Oroville Dam - Oroville Dam in northern California is the tallest earthen dam in the United States and holds more than 1.1 trillion gallons of water in Lake Oroville, the second-largest manmade lake in California. Because of unusually high rainfall in early 2017, Lake Oroville began reaching its storage capacity and dam operators released a flow of water down the main spillway (basically a concrete ramp) and into the Feather River. This high-water flow surged over the side of the spillway and began eroding the soil underneath, causing the concrete of the spillway to break apart, and operators were forced to shut down the release of water.

Continuing rainfall runoff caused the dam to begin overtopping the emergency spillway, which consisted of a concrete berm on the inside of the dam, with a bare soil hillside on the other side. As the water flowed down this hillside, the soil eroded away much faster than expected. If enough of the hillside washed away, the wall of the dam would be unsupported and could break apart, suddenly releasing a major portion of Lake Oroville down the Feather River. On February 12, officials ordered the evacuation of 188,000 people in the Feather River Basin throughout Butte, Yuba and Sutter Counties, until the hillside was stabilized and sufficient water drained from the lake on February 14.

Dams and Reservoirs Affecting the City of Santa Ana

The City of Santa Ana owns ten water reservoirs at eight locations throughout the City, ranging from a capacity of 1 million gallons to 7 million gallons. Some of these reservoirs store water in above ground tanks while others store water primarily at or below ground level. For above ground tanks, collapse brought on by earthquake, acts of sabotage or other catastrophic failure may result in (in addition to the loss of water supply) substantial localized flooding; and damage to buildings, vehicles, properties, roadways, utility equipment or other structures, and injury to any persons, in the path of the spilling water. For tanks storing water primarily at or below ground level, failure would not cause widespread surface flooding, damage, or injuries. However, failure of these reservoirs may cause (in addition to the loss of water supply) damage to underground utility lines, seepage into the foundations of nearby structures, and sub-surface erosion to roadways and other properties in the area. The City also owns a 140-foot tall-elevated water tank, storing up to 1 million gallons of water, in the area of 14th Street and the 5 Freeway. Sudden failure of this structure could result in collapse onto neighboring buildings immediately adjacent to the tank, including an elementary school, and/or localized flooding in the immediate area.

There are three large dams that are outside of the City but are capable of creating substantial flooding in the City in the event of catastrophic failures. These include Prado Dam, Villa Park Dam and Santiago Creek Dam and these are described below.

Prado Dam – Prado Dam is a flood control and water conservation project constructed and operated by the U.S. Army Corps of Engineers. The dam is located on the Santa Ana River approximately 30 miles upstream of the Pacific Ocean and 20 miles upstream of the City of Santa Ana. The dam embankment is located in Riverside County on the north side of the 91 Freeway, approximately 2 miles west of the City of Corona and just east of the

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Orange County line. Portions of the reservoir behind the dam are in both Riverside and San Bernardino Counties. The dam is located at the upper end of the Lower Santa Ana River Canyon, which is a natural constriction controlling 2,255 square miles of the 2,450 square mile Santa Ana River watershed.

Prado Dam provides flood control and water conservation storage for Orange County. It is the downstream element of the Santa Ana River flood control system. The purpose of the system is to collect runoff from the uncontrolled drainage areas upstream, along with releases from other storage facilities. Generally, when the water surface elevation in the reservoir is below 494.0 feet during flood season or 505.0 feet during non-flood season, water releases are made to provide water supply to downstream consumers. These releases are coordinated with the Orange County Water District and are based upon the capacity of their groundwater recharge facilities and agreements with other agencies.

If the water level in the reservoir exceeds the top of the buffer pool (the water levels mentioned above), flood control releases commence. The objective of the flood control release is to drain the reservoir back to the top of the buffer pool as quickly as possible without exceeding the capacity of the channel downstream. In current practice, when the water surface in the reservoir exceeds the top of the buffer pool, water releases are increased to match water inflow, up to 5000 cubic feet per second (cfs). If inflows exceed 5000 cfs, the excess water accumulates in the reservoir. If the water surface elevation in the reservoir reaches 543.0 feet, uncontrolled releases from the spillway will commence. These high flows of water would result in very high, fast-moving water in the Santa Ana River through the City. These could potentially overtop the banks of the River, particularly if it occurs in conjunction with heavy rainfall, resulting in flooding conditions. In addition to the potential for overtopping, the high, fast flow could endanger pedestrians, homeless encampments, or any persons in or near the riverbed.

Catastrophic failure of Prado Dam would inundate a wide swath of northern, central and coastal Orange County, from the Riverside County line to Huntington Beach and including a large portion of the City of Santa Ana. Almost 1 million people live within this inundation zone.

Villa Park Dam – Villa Park Dam is an earthen dam on Santiago Creek approximately 5 miles upstream of the City of Santa Ana. It was constructed for flood control, primarily during rainstorms, for the Cities of Villa Park, Orange, Tustin and Santa Ana and regulates the flow of Santiago Creek into the Santa Ana River.

Santiago Creek Dam - Santiago Reservoir and Dam is an earth-filled structure owned by the Serrano Water District (SWD) and Irvine Ranch Water District (IRWD). Santiago Reservoir provides raw potable water storage for SWD and IRWD. It is located on Santiago Creek about three miles upstream of Villa Park Dam in Santiago Canyon and about 8 miles upstream of the City of Santa Ana.

The Dam/Reservoir Failure Annex to this Plan provides charts and maps to detail the water levels and geographic extent of the resulting flooding for these scenarios.

2.4.7 Communications Failure

The US Department of Homeland Security has identified the communications sector as a fundamental lifeline critical to government and business functions and essential to human health and safety and economic security. Residents, business and government are dependent on, or receive critical services from organizations dependent on, landline and cell phone communications, internet and data communications, two-way radio communications, and cable, broadcast and satellite information sources.

Potential Causes of Communications Failure

Communications networks involve both physical infrastructure (buildings, switches, towers, antennas, etc.) and cyber infrastructure (routing and switching software, operational support systems, user applications, etc.) and many of these components are highly interdependent. This infrastructure can be susceptible to numerous natural or human-caused disruptions. Some of these may disrupt some communications networks and leave others operating, and some may disable every communication system at once. Some disruptions may remain local to the city or county area, and some may extend across several states or be national or international in scope.

Physical equipment may fail or be damaged by severe weather events, such as extreme heat, flooding, lightning storms or wildfires. Physical equipment will begin to fail if a power outage extends beyond the capacity of backup batteries or fuel supply for generators. Foreign or domestic terrorists may attack equipment with explosives or other damaging devices. A cyberattack may be used to disable or shut down networks or equipment. Because communication systems are operated by many different vendors or providers and physical equipment is dispersed geographically, most of these events would likely cause only some communications systems to fail and would likely be regional in scope, not national or international.

Some events however, may be capable of disabling every form of electronic communication simultaneously and extend across the region, nation or beyond.

One example is an Electro-Magnetic Pulse (EMP). An EMP can occur if a hostile actor, either a foreign state or a well-advanced terrorist organization, detonated a nuclear weapon high in the atmosphere above the Earth. Unlike a nuclear detonation close to ground level, an EMP would cause no damage related to blast, heat or radiation and would have little or no effect on human health. However, the sudden burst of radiation released into the Earth's electro-magnetic field (at about 20 miles altitude) would shower the Earth below with an intense burst of electrical energy over a vast region. This overwhelming burst of energy would instantly overload power grids and burn out any device or equipment operating with electricity, including any type of electronic communication, any computer equipment, any electrical appliance, or even any motor vehicle or mode of travel with electronic components.

Another example is a solar or geomagnetic storm (also called space weather). This occurs from a solar flare or Coronal Mass Ejection (CME), which is a sudden burst of plasma and electro-magnetic energy from the surface of the sun. If this is ejected in the direction of the Earth and is strong enough to collide with Earth's atmosphere, it may cause similar damage as an electro-magnetic pulse attack (essentially a naturally occurring EMP). Solar storms impacting Earth occur regularly through history, perhaps every few centuries, but we have not yet experienced a major impact from one during the modern communications age.

The most intense solar storm in recorded history was the Carrington Event occurring in September 1859. This caused auroral displays ("northern lights") to appear all over the world and brighten the night sky enough to wake people from sleep. Telegraph systems (the only electrical equipment in use at the time) throughout Europe and North America received strong enough electrical charges to destroy equipment, start fires and shock telegraph operators. In July 2012, a solar storm of similar strength occurred, but passed just outside the Earth's orbit.

Impacts of Communications Failures

Virtually every element of modern life is dependent on electronic communications, and modern society has never had to try to function without them. In addition to the widespread disruption this would cause to residents, businesses and government, it would also eliminate three critical tools that public safety and emergency management officials rely on to respond to and manage any emergency: First, we would lose the ability to receive information or calls for help from the public or to gain awareness of what is occurring. Second, we would lose the ability to dispatch first responders and emergency workers to where they are needed or to coordinate their

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response. Third, we would have little ability to distribute information, warnings or emergency instructions out to the public.

Loss of communications would create an immediate risk to life and property as well as significant panic and disruption throughout the community in many ways, which may include:

911 Communications - The most immediate threat to life or property from the loss of communications would stem from the loss of 911 communications. Santa Ana Police Department's Communications Division received 114,293 incoming 911 calls in calendar year 2022. Of these, 1,779 were Priority 1 calls, defined as representing an immediate threat to life. Another 28,276 were Priority 2 calls, defined as representing an immediate or potential threat to the safety of persons or property, or serious crimes occurring or just occurred. 19,185 of these calls were transferred to Orange County Fire Authority for their dispatch to structure, vehicle or other fires; medical emergencies; and other fire or rescue calls. The remaining 84,238 calls, as well as 332,069 calls to the Police Department's non-emergency telephone lines in 2022, represent the vast number of requests for service or information from the public.

Loss of telecommunications (cellular, landline or both) would make it extremely difficult for the public to ask for help in any of these situations; instead, to summon help, most people would need to physically travel to a police or fire station. A loss of radio and data communications may mean that emergency responders could only be dispatched in person, directly from the police or fire station. Once dispatched, emergency responders would be unable to communicate back to request additional assistance or information or to coordinate with other responders.

Utility Controls – The electrical power grid, natural gas distribution systems, and water and wastewater distribution and collection systems depend on electronic communications to keep those systems running; loss of communications would quickly result in failure, shortages or outages of these utilities.

Financial Transactions – In modern society, the vast majority of financial transactions are electronic. This includes the deposit, transfer or withdrawal of funds from accounts, whether business-to-business, paycheck deposits, or transactions by individual consumers. Purchases are now usually made with purchase orders, credits or other electronic transfers at the business level, and at the consumer level, most purchases are made with credit or debit cards, cell phone transactions, or cash drawn from ATM machines. Loss of electronic communications would eliminate all of these and reduce all financial transactions to those where the buyer, the seller, the product and the cash are all physically present in the same place at the same time to complete the exchange.

Personal and Family Communications – Family members would be unable to communicate with each other to coordinate their locations, schedules or transportation plans. This could cause significant disruption or panic in the community if family members or parents are unable to locate or re-unite with each other or their children.

Medical and Health Care Communications – Medical care, particularly emergency medical treatment, depends on the rapid, electronic exchange of medical records and treatment instructions among pre-hospital emergency care providers, hospitals and emergency rooms, pharmacies, and doctor's offices. Delay or inability to exchange this information could contribute to the rapid deterioration or death of affected patients.

2.4.8 Civil Unrest

There is a wide variety of public behavior that may be disruptive or disorderly and may be legal or illegal, and most of this activity would not constitute an emergency under this Plan. For the purposes of this Plan, civil unrest is defined as a widespread outbreak of rioting, violence, looting, property destruction, arson, or attacks on law enforcement or other government functions. At its extreme, civil unrest may be defined as the breakdown of civil society, causing a substantial threat to life and property and an inability to travel in the community, to engage in commerce, or to access public or private services.

Not all protests, marches or demonstrations, including those with disruptive or angry crowds, would constitute civil unrest; many of these may be lawful public assembly and free speech. Civil disobedience, where crowds engage in illegal behavior that requires a law enforcement response (such as excessive noise, sit-ins, blocking traffic, or disrupting events) also would not be considered an emergency under this Plan; which instead focuses on widespread, sustained threats to life and property.

Civil unrest is often distinguished by the fact that normal on-duty police and public safety resources cannot adequately manage the situation until additional mutual aid resources can be mobilized, and civil unrest may grow to large proportions during this initial response phase.

Civil Unrest Causes and Motivations

Civil unrest may occur spontaneously or as the result of organized incitement. Civil unrest can be spurred by specific events, such as retaliation for or celebration of the results of large sporting events or verdicts in high-profile criminal trials. Civil unrest can also be the result of long-term grievances against government authority or policy or anger over a variety of economic, political or social factors in a community. Civil unrest can be used as a tactic designed to bring attention to any of these causes.

Individuals may attempt to lead civil unrest, but frequently it occurs as the result of disorganized groups coalescing into herd behavior or mob psychology, where the anger, excitement, or violent or destructive behavior of some people encourages or reinforces more of the same behavior in others. As the crowd grows larger and more chaotic, the more each individual will feel that they can engage in unrest without being specifically observed, identified or apprehended.

Additionally, terrorists could use the chaotic activity of civil unrest, either spontaneous or planned, to provide misdirection of their intent, to camouflage their actions, or to magnify the results of an attack.

Civil Unrest Events

Southern California has faced civil unrest in various forms since the Watts riots of 1965, Huntington Beach surf riots in August 1986 and July 2013, Anaheim civil unrest in July 2012, Fullerton-Kelly Thomas trial in January 2014 and OC Fairgrounds Trump rally in April 2016.

The most prominent example in recent history is the 1992 Los Angeles riots, also known as the Rodney King riots. In March 1991, Rodney King led police officers on a lengthy, high-speed chase throughout Los Angeles, and when finally stopped, offered physical resistance when being taken into custody. A bystander videotaped police officers striking King with batons and shocking him with Tasers numerous times for approximately 12 minutes. Four police officers were charged with various assault and excessive force offenses, but a jury acquitted three of the officers of all charges and acquitted the fourth of all but one charge.

The trial was closely followed by the public and protests began as soon as the verdicts were announced. Protests quickly escalated into thousands of people participating in riots, lootings, arsons, assaults and killings that spread throughout the City of Los Angeles and lasted for six days. Schools, banks and businesses were closed. Major league sports events, concerts and other entertainment events were cancelled. Mass transit ceased operating and

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several freeways were closed. Assaults, arsons and looting, as well as business owners shooting at looters, were broadcast live on television.

Police forces were widely criticized for responding too slowly and deploying too few resources. Eventually, thousands of police officers were supplemented by deployment of the California National Guard, the 7th US Army Infantry Division and the 1st US Marine Corps Division to bring the situation under control. Over 11,000 offenders were arrested during the rioting and looting, but almost a third of these were released without charges due to the inability to distinguish who committed which offenses. In total, 58 people were killed, approximately 2,000 were injured, 3,600 fires were set and 1,100 buildings were destroyed, and financial losses were estimated at between \$800 million and \$1 billion dollars.

On May 25, 2021, Minneapolis Police in Minneapolis, Minnesota arrested George Floyd. A citizen utilizing a cell phone captured the arrest on video, which depicts an officer placing his knee on the neck of Floyd while other officers knelt on or restrained other parts of his body. This use of force resulted in the asphyxiation death of Floyd, which prompted nationwide protest, demanding the arrest and prosecution of the officers involved. As the video of Floyd's death circulated, nationwide protests began to occur. On May 27, the City of Los Angeles experienced there first of many protests, which would continue into June of 2020. On May 30, 2020 the City of Santa Ana would experience its' first of many protests which turned violent, taxed resources and significantly affected City operations.

2.4.9 Targeted Act of Violence

Targeted violence refers to premeditated violence directed at specific individuals, groups, or locations. Perpetrators select their targets to achieve a specific motive, such as the resolution of a real or perceived grievance or to make a political or ideological statement. Targeted violence is distinguished from ordinary criminal acts, such as robberies or assaults, by pre-attack behaviors that suggest violence is planned and is the intended outcome, rather than an impulsive, random or spontaneous act.

Targeted violence may be carried out by lone offenders or by individuals belonging to one or more hate groups. Targeted violence is most often carried out in the form of an “active shooter” or mass shootings, but may also include attacks with edged weapons, improvised explosive devices, ramming a vehicle into a crowd, or a combination of several of these methods.

Active Shooter Incidents Defined

The United States Departments of Justice and Homeland Security define an active shooter as an individual actively engaged in killing or attempting to kill people (with the use of firearms) in a populated area. The definition has been modified to recognize that in some cases, there could be multiple shooters and the area may span multiple locations. A mass shooting is defined by these agencies as the shooting of three or more people in one incident. For the purposes of this Plan, the key characteristics are shooting that is still occurring when law enforcement and emergency medical responders are dispatched and which results in multiple or numerous victims.

Active Shooter Incidents (ASI), or other targeted acts of violence, frequently occur with no specific motivation against any individual victim, instead the motivation may be a generalized sense of grievance, anger or resentment or a general desire to inflict harm on others. In some cases, the incident may begin from a pre-existing personal or employment relationship or a grievance against a class of people based on some social, political, religious or other characteristics. And in some cases, terrorist groups or sympathizers may use targeted violence to inflict harm. But regardless of motivation, once targeted violence is initiated, the goal is usually to kill and injure as many persons as possible and the perpetrator(s) are usually not interested in any other outcome.

Characteristics of Active Shooter Incidents

The Federal Bureau of Investigation (FBI) compiled A Study of Active Shooter Incidents in the United States Between 2000 and 2013 and supplemented this with Active Shooter Incidents 20-Year Review, 2000-2019. These papers studied 333 ASI's during those years, and updated statistics added 151 more events from 2020 through 2022. This averages a little over 21 incidents per year or almost two each month. The average annual occurrence is rising, with an average of 6.4 incidents occurring in each of the first 7 years of the study, 16.4 incidents occurring in each of the second 7 years, and 33.4 incidents per year in the final 9 years.

ASI's have occurred in virtually any place where multiple persons can gather together, including businesses open to public traffic, businesses not open to public traffic, shopping centers, sports or entertainment venues, government buildings and courthouses, schools and colleges of all grade levels, military bases, health care facilities, religious institutions, night clubs, and parks or other open spaces. Most incidents occurred in businesses or other commercial venues (46%), schools and colleges (24%), and government or military facilities (10%). In over 15% of cases, the incident occurred in more than one location.

In 60% of the cases studied, the incident ended before law enforcement arrived on the scene. In incidents where the actual time duration could be ascertained, 69% of the incidents ended in 5 minutes or less. In 56% of the cases, the incident ended at the shooter's initiative, either by the shooter committing suicide (40% of incidents), or by the shooter fleeing or surrendering. In 28% of the cases, the incident ended with law enforcement engaging the shooter in gunfire. In 13% of the cases, the incident ended after citizens or off-duty officers intervened to restrain the shooter.

Primary Examples of Active Shooter Incidents

University of Texas-Austin – The first event now recognized as an ASI occurred on August 1, 1966 at the University of Texas-Austin campus. A university student, who was formerly trained as a Marine Corps sniper, killed two family members in their homes and then climbed to the 27th floor observation deck of the university clock tower, armed with rifles, pistols and a shotgun. For one and a half hours the sniper fired on anyone within view from the tower, killing 13 and wounding 31 more, until police officers were able to get into the building, ascend to the top and kill him with return fire.

Columbine High School – On April 20, 1999, two students at Columbine High School in Littleton, Colorado entered the school armed with semi-automatic handguns and sawed-off shotguns concealed in their clothing. They also placed a number of improvised explosive devices around the school as they entered. Working together, the two walked through the cafeteria and library areas of the school, opening fire on students and faculty, killing 13 and wounding 21 more, and detonating the devices. After about 50 minutes, when they could find no more victims and law enforcement officers were closing in, the two simultaneously committed suicide.

The Columbine shooting really introduced the concept of an ASI. Prior to this, police response was designed toward stabilizing and containing the situation, gathering resources and organizing a SWAT-type response, and if possible, negotiating for a peaceful outcome with no more lives lost. Columbine brought the realization that in an ASI, the shooter(s) do not want to stabilize the situation or negotiate for any other outcome, their primary goal is to kill and injure as many people as they can as quickly as possible. In most cases, the active shooter does not even plan to survive the event. Accordingly, law enforcement tactics had to change to rapid intervention with the best resources that are immediately available.

Las Vegas Strip – On October 1, 2017 at 10:05 PM, a lone gunman opened fire on a crowd of thousands attending the Route 91 Harvest country music festival, an outdoor music concert staged on the Las Vegas Strip. The gunman opened fire, using multiple weapons converted to automatic-fire, from a 32nd floor room of the Mandalay Bay Hotel, which overlooked the concert. Over 10 minutes, he fired more than 1,100 rounds into the crowd (more than 100 rounds per minute), before killing himself with a self-inflicted gunshot wound when police and security officers began preparing to make entry into the room.

This became the deadliest mass shooting event in the United States, to date. Concertgoers and officials initially did not identify the sound of gunfire over the concert music and could not immediately locate the source of the gunfire coming from high above the street. Concertgoers were in a very exposed location, unable to take cover from the raised sniper position, and unable to quickly or safely evacuate such a large, crowded venue. This ASI resulted in a true mass-casualty event, with over 900 direct victims: 58 people were killed and 422 more were wounded by gunfire, and 429 more were injured taking cover or running from the event.

Robb Elementary School - On May 24, 2022 at approximately 11:30 AM, a teenage gunman entered Robb Elementary School in Uvalde, Texas, opening fire on students and teachers, firing more than 100 rounds from an AR-15 assault rifle in approximately two and a half minutes. A delayed law enforcement response allowed the gunman to remain barricaded in a classroom with wounded victims for approximately one hour and 20 minutes, before officers breached the classroom and killed the shooter in a gun battle. Nineteen third and fourth grade students and two teachers were killed; seventeen more students and teachers were wounded.

Highest Casualty Count Events - The FBI Active Shooter Study compiled statistics on the worst-case (highest casualty count) incidents occurring between 2000 and June 2016. The chart below lists these events, with the University of Texas and Columbine High School events, which occurred before the years of the study, and the Las Vegas Strip event, which occurred after, also inserted, in order:

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Location	City	Date	Casualties
Las Vegas Strip	Las Vegas, Nevada	October 1, 2017	909 (58 killed, 851 wounded)
Pulse Night Club	Orlando, Florida	June 12, 2016	102 (49 killed, 53 wounded)
Cinemark Century 16 Theater	Aurora, Colorado	July 20, 2012	70 (12 killed, 58 wounded)
Central Avenue Independence Day Parade	Highland Park, Illinois	July 4, 2022	55 (7 killed, 48 wounded)
Virginia Tech State University	Blacksburg, Virginia	April 16, 2007	49 (32 killed, 17 wounded)
University of Texas-Austin	Austin, Texas	August 1, 1966	46 (15 killed, 31 wounded)
Ft. Hood US Army Base	Ft. Hood, Texas	November 5, 2009	45 (13 killed, 32 wounded)
Cielo Vista Walmart	El Paso, Texas	August 3, 2019	45 (23 killed, 22 wounded)
Robb Elementary School	Uvalde, Texas	May 24, 2022	38 (21 killed, 17 wounded)
Inland Regional Center	San Bernardino, California	December 2, 2015	36 (14 killed, 22 wounded)
Columbine High School	Littleton, Colorado	April 20, 1999	34 (13 killed, 21 wounded)
Sandy Hook Elementary School	Newtown, Connecticut	December 14, 2012	29 (27 killed, 2 wounded)

Orange County Active Shooter Incidents - On July 12, 1976, a Cal State University-Fullerton custodian entered the university library with a rifle and, traveling through the first floor and basement, killed seven people and wounded two more. He left the university in his car but shortly thereafter called the police to turn himself in.

On October 12, 2011, a man armed with three handguns and wearing body armor entered the Salon Meritage Hair Salon in Seal Beach, where his ex-wife worked. He killed seven persons and wounded one more inside the salon, and killed one more person seated outside in a vehicle as he fled the scene. Police apprehended him as he drove away from the scene.

On August 23, 2023, at approximately 7:00 PM, a man traveled to the Cook's Corner restaurant and bar in the Orange County unincorporated area of Trabuco Canyon, in search of his estranged wife, who was dining there with a friend. He entered the crowded restaurant with two handguns, shooting and gravely wounding his wife and killing her dining companion, and continued firing randomly at other restaurant guests. He returned to his car to retrieve a third handgun and a shotgun, continuing to shoot at guests as he passed and killing a bystander who attempted to stop him. Shooting was still occurring when police officers arrived, and the shooter was killed after several minutes of exchanging gunfire with police. A total of three victims were killed (not including the shooter) and six more were wounded in the event.

Impacts of Targeted Violence Incidents

Any urban city will have violence related to criminal or gang activity or personal disputes occurring on a regular basis. Suburban and rural locations will experience these occasionally as well and these do not constitute major emergencies. In contrast, an ASI or targeted violence incident will have a magnified impact on the jurisdiction, requiring the use of far more resources over a much longer period of time.

Targeted violence can generate a large number of critically injured persons requiring significant emergency medical treatment, overwhelming the available emergency medical services, ground and air ambulance services,

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and hospital emergency rooms, trauma centers and surgery facilities. This may result in a mass-casualty incident requiring the utilization of mutual aid resources from many surrounding communities. There may be additional victims not injured by weapons but who are instead injured while fleeing the scene. There also may be a substantial number of survivors, witnesses, rescuers or family members who experience significant psychological trauma from the event and require mental health or counseling support, particularly if the event occurs at a school or other location with many child victims.

Multiple deceased victims will require a lengthy process to recover the remains of victims from the scene or from hospital facilities, to perform autopsies, to positively identify the victims and make notifications to the next of kin, and to process the bodies for release to funeral homes. This may overwhelm the capabilities of the coroner's office, which may not be equipped to handle many traumatic deaths occurring simultaneously. Some bodies may have to be processed by coroner's offices in neighboring counties through mutual aid. This can result in a lengthy period of time and confusion before all deceased victims are identified and all family members are notified. For persons who survive the shooting but are transported to hospitals for treatment or are evacuated to other locations, there may be a lengthy period of time before their family members learn their condition and location and can be reunified with them. These delays usually cannot be avoided but greatly increase the worry, confusion and psychological trauma experienced by family members. This can also result in 911 dispatch centers, city halls, police and fire department offices, hospitals, school offices or other relevant locations being overwhelmed with desperate phone calls or in-person requests for information.

The location of the violence (school, government office, business or other facility) will remain closed and out of operation for a substantial period of time. Once all victims have been transported or evacuated from the scene, any weapons or devices left behind must be rendered safe and removed. The bodies of the deceased must be documented and removed. An extensive crime scene investigation may take days to complete. Personal belongings left behind may then be collected. Extensive clean-up and repair of bullet holes, bloodstains or other evidence of the event may be required before the building can be re-occupied. This means that the building will not be able to be used for weeks or months, with a lengthy subsequent disruption to government services, education, commerce or other specific uses of the facility. In some cases, the facility will be a complete loss. This was the case with the Sandy Hook Elementary School shooting, where 20 young children and 6 adults were killed. The decision was made that the school could not be re-opened and was completely replaced with a new school.

A significant act of targeted violence will result in local, national and international news coverage at a level likely never experienced before by the jurisdiction; with 24-hour coverage; live video broadcasts; rumors and inaccurate or incomplete information; news conferences; and interviews with responders, victims, witnesses and survivors. Marches, vigils, memorials and other public expressions of grief or anger, either planned or spontaneous, may continue for weeks, and for years afterwards on anniversary dates.

If the perpetrator(s) survive the event, this may result in criminal investigation, psychological evaluations, prosecution, trial and punishment efforts continuing for years into the future. This can extend the public grief, recovery process, news coverage and disruptions to the facility and community for many years. If the motivation for the shooting has a connection to a terrorist group or terrorist planning network, the scope of the investigation and prosecution, and the agencies involved in them, become national or international in scope.

2.4.10 Disease Outbreak/Pandemic

Disease Outbreak Definitions

A widespread disease outbreak with significant morbidity and mortality is one of the primary public health concerns of the 21st century. Vaccines, antibiotics and improved living conditions resulted in dramatic declines in communicable diseases in the latter part of the 20th century, and while transmission of communicable diseases still occurs on a daily basis in every community, most instances are not of the severity or magnitude to be considered an emergency. However, infectious diseases remain a threat to all persons in the City due to a variety of factors, including:

- Population growth (denser populations, aging, migration),
- Methods of food production (widespread importation and distribution),
- Environmental changes (climate change, encroachment of humans on wild areas),
- Microbial adaptation (resistance to antibiotics, genetic mutations),
- Changes in health care (drugs causing immunosuppression, overuse of antibiotics), and
- Human behavior (travel, diet, compromised immune systems, failure to receive immunizations).

An outbreak, epidemic or pandemic, or the introduction of a novel disease, could pose a large threat to the health of the community. A disease outbreak arises when the incidence of disease within a specific community or geographical area during a specified time period (e.g. flu season) exceeds what would normally be expected. An outbreak may occur with:

- A single case of a disease long absent from a population (e.g. smallpox),
- A disease organism, bacterium or virus not previously recognized in the community or geographical area,
- A previously endemic disease for which immunity has decreased due to lack of recent circulation and/or decreased immunization rates, or
- The emergence of a previously unknown disease within a community.

An epidemic occurs when a disease outbreak becomes widely established in the community or geographical area, and a pandemic occurs when the disease becomes prevalent in multiple regions, nations or continents. Outbreaks may occur naturally or can be introduced intentionally through bioterrorism. Outbreaks may last for a few days, weeks, or for several years.

Disease Outbreak Threats

According to the Orange County Health Care Agency (OCHCA), the diseases currently of concern for outbreak in Orange County include:

- Influenza, including seasonal, novel and/or pandemic influenza strains,
- Childhood vaccine-preventable diseases such as measles and pertussis,
- Foodborne illness, including norovirus, salmonella or E. Coli,
- Vector-borne viruses such as West Nile Virus (WNV) or Zika, and
- Novel, emerging pathogens, such as Middle East Respiratory Syndrome, Coronavirus or Ebola.

Influenza, including Seasonal, Novel, and/or Pandemic Influenza Strains

Influenza is a contagious respiratory illness caused by a variety of influenza viruses. Although most flu illnesses are mild and are similar to the common cold, severe cases cause on average more than 200,000 hospitalizations and up to 49,000 deaths each year in the United States, primarily among older persons or persons with chronic health conditions. In Orange County, severe influenza cases (defined as persons who have influenza and are admitted to the intensive care unit or die) in persons less than 65 years of age are reportable. Orange County has reported as many as 57 severe influenza cases, with 21 deaths, in one season during the annual outbreak period.

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Human flu viruses spread easily from person to person, primarily through coughing or sneezing or contact with recently infected surfaces.

A flu pandemic occurs when a new or mutated influenza virus that humans have not encountered before, and therefore have no immunity to, begins circulating and spreads quickly from person to person, causing substantial morbidity and mortality across geographic areas. Orange County HCA routinely does surveillance for seasonal influenza as well as enhanced surveillance for novel strains and human infections with bird (avian) or pig (swine) influenza strains that are circulating in other parts of the country and the world. In 2009, an H1N1 influenza pandemic spread quickly and led to over 200 severe influenza cases and 50 deaths in Orange County. The H1N1 influenza virus (a mutated form of swine flu) quickly established itself as a seasonal influenza strain and was the predominant virus in the 2013-14 influenza season. Although the mortality rate from H1N1 influenza during this pandemic was low, other strains may cause more severe illness with case fatality rates as high as 6%.

An influenza pandemic is likely to occur in waves of infection, each lasting approximately 8 to 12 weeks and separated by weeks of inactivity. In total, it could last from 18 months to several years. An example is the Spanish Flu outbreak occurring at the end of World War I, which progressed through successively greater waves in 1918, 1919 and 1920. It is reported that more U.S. service members serving in the war died of flu than died in combat. While flu diagnosis, medical treatment and medical records were much less advanced during this time, it is estimated that Spanish flu (a mutated bird flu virus) killed more than 50 million people, or possibly more than 3% of the world's population at that time. Even with the limited and slower transportation methods available at that time, Spanish flu still spread throughout the world and killed persons on all six continents (excluding Antarctica). With today's ability to travel from continent to continent within hours, a flu pandemic could spread exponentially faster.

An influenza pandemic is likely to affect everyone in Orange County at some point and can greatly affect all sectors of society and government. A pandemic will place great strain on existing health care resources and may exceed available resources. Personnel, supplies, equipment, and pharmaceutical responses (e.g., vaccination and antivirals) may be in short supply and/or unavailable. All public and private sector services rely on staff and employees to function, and as more people become sick, more sectors will be unable to sustain operations. Health care services, food production, transportation systems, utilities and emergency services may be compromised or unavailable. Pandemics would occur simultaneously throughout much of the County and State, and possibly other states as well, which would severely limit the availability of mutual aid assistance and resources from other areas.

Childhood Vaccine-Preventable Diseases, such as Measles and Pertussis

Before the middle of the last century, life-threatening diseases such as *Haemophilus influenzae*, diphtheria, polio, measles and rubella affected hundreds of thousands of infants, children, and adults in the United States, with thousands dying every year. Since the advent and widespread use of vaccines, these diseases have declined dramatically and nationally, vaccine-preventable disease levels are at or near record lows. Vaccinations for chickenpox, diphtheria, *Haemophilus influenzae* type B, hepatitis A, hepatitis B, influenza, measles, mumps, pertussis, polio, pneumococcus, rotavirus, and rubella are now routinely available for infants and children. However, this is not the case throughout the world and outbreaks of diseases such as polio and measles still occur regularly in other regions. Even though most children in the U.S. have received the recommended vaccines by age 2 years, many under-immunized children remain, leaving the community vulnerable to outbreaks of these diseases.

Measles – Measles is one of the most contagious of all infectious diseases with over 90% of exposed people developing infection if they are not already immune, either by previous infection or by immunization. In the pre-vaccination era, there were on average over 500,000 cases in the U.S. and almost 500 deaths reported annually. Cases dropped dramatically after vaccination against measles was introduced in the 1960's and a second dose of vaccine was routinely recommended in 1989. In 2000, measles was declared eliminated in the U.S., meaning there was no ongoing transmission, but cases and outbreaks continue to occur from visitors or returning travelers from countries where measles is still common, thereby introducing the virus into unvaccinated or under-vaccinated communities. In the U.S. there have been between 37 to 644 cases of measles reported each year, with multiple outbreaks reported in 2013, 2014, and 2015. In Orange County, 0-1 cases of measles were reported annually

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between 2010 and 2013, but large outbreaks resulted in 23 cases reported in 2014, and 35 cases reported in the first few months of 2015.

Pertussis – Pertussis (whooping cough) is a highly contagious respiratory infection caused by the bacteria *Bordetella pertussis*. Although symptoms may be mild and resemble an ordinary cold in some people, the infection may become more serious, particularly in infants, and cause hospitalizations and even death. Infections in the U.S. decreased dramatically with the advent of the whole-cell DTP (diphtheria, tetanus, pertussis) vaccine in the 1940's, but have increased over the past 20-30 years, partially because of increased awareness, improved testing, better reporting, and waning immunity from the acellular pertussis vaccine (DTaP) used since the 1990's. California has had particularly large outbreaks since 2010 with numbers as high as those in the 1940's. Over 9,000 pertussis cases and 10 infant deaths were reported with disease onset in 2010 and over 11,000 cases and three infant deaths were reported with disease onset in 2014. In Orange County, 467 pertussis cases were reported in 2010 and 397 in 2014.

Foodborne Illness, including Norovirus

The Centers for Disease Control and Prevention (CDC) estimates that every year approximately one in six Americans (or 48 million people) get sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases in the United States. Extrapolated to the Orange County population, this would suggest approximately 500,000 people get sick with foodborne illness each year. Examples of reportable illnesses that may potentially be food-borne include bacteria such as *Salmonella*, *Campylobacter*, and shiga toxin-producing *Escherichia coli* (*E. Coli*). In Orange County, on average approximately 400 cases of *Salmonella*, 400 *Campylobacter*, and 40 *E. Coli* are reported each year. Not all foodborne illness is reportable and even the diseases that are reportable are under-reported and under-diagnosed. It is difficult to document the exact numbers of people affected.

In general, foodborne illnesses cause symptoms such as diarrhea, vomiting, and/or abdominal cramps. Some people may also have fever. Complications of foodborne illnesses include dehydration and spread of the infection to the blood or other parts of the body, especially if a bacterium is involved. Foodborne illnesses can result from exposure to contaminated food prepared at home or at a restaurant or market, from contaminated food sources and/or human error in preparation or storage. Each year, Orange County Health Care Agency receives 800-1,000 reports of foodborne illness, and investigates 20-40 foodborne outbreaks.

Vector-Borne Diseases

Information for this assessment was obtained from the Orange County Mosquito and Vector Control District. The mission of the Orange County Mosquito and Vector Control District (District) is to protect Orange County citizens from vectors and the diseases they carry. The District routinely conducts field surveys to determine the presence of vectors and vector-borne diseases. The majority of the District's resources are devoted to the control of mosquitoes, rats, flies, and Red Imported Fire Ants (RIFA). Surveillance and detection programs are designed around each of these vectors. The District has identified the following vector-borne diseases as a potential threat to residents of Orange County. Natural disasters such as earthquakes, fires, and floods may increase local mosquito populations and the overall risk of these diseases being transmitted to residents of Orange County.

Mosquito-Borne Disease - The District's surveillance and mosquito control efforts are focused on these mosquito-borne diseases:

- West Nile Virus (WNV),
- Saint Louis Encephalitis (SLE),
- Invasive *Aedes* diseases (chikungunya, dengue, Zika, yellow fever), and
- Malaria.

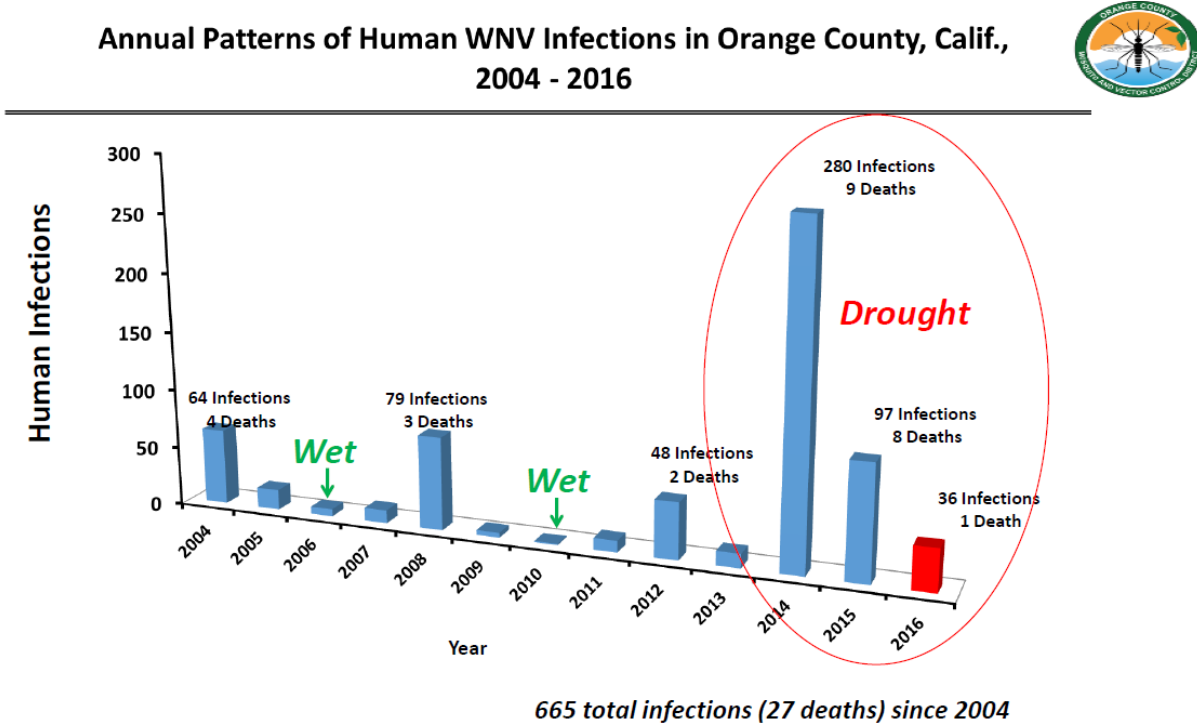
In 2015, two invasive *Aedes* mosquito species were detected in multiple locations in Orange County. The presence of *Aedes albopictus* and *Aedes aegypti* mosquitoes in the County indicates that chikungunya, dengue, Zika, and

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yellow fever viruses could possibly be transmitted within Orange County. The District expects the populations of these mosquitoes to increase and expand their distribution in Orange County.

West Nile virus (WNV) has been present in Orange County since 2003. In 2014 and 2015, the District experienced super epidemics of WNV resulting in 377 human infections with 17 deaths. In 2016, the County experienced 665 infections and 27 deaths.

Figure 91a West Nile Virus Infections in Orange County



The City of Santa Ana consistently ranks as having one of the highest risk areas for WNV infection:

Figure 91b High Risk Cities for West Nile Virus

City	Total WNV Human Infections 2004-2016
Santa Ana	120
Anaheim	101
Fullerton	59
Orange	50
Garden Grove	41
Huntington Beach	40
Tustin	25
Buena Park	24
La Habra	24
Brea	15
Costa Mesa	15
Irvine	15
Placentia	15
Yorba Linda	12
Cypress	12
Los Alamitos	9
Fountain Valley	8
Seal Beach	8
Laguna Niguel	6
Westminster	6

High Risk Area 9 Cities

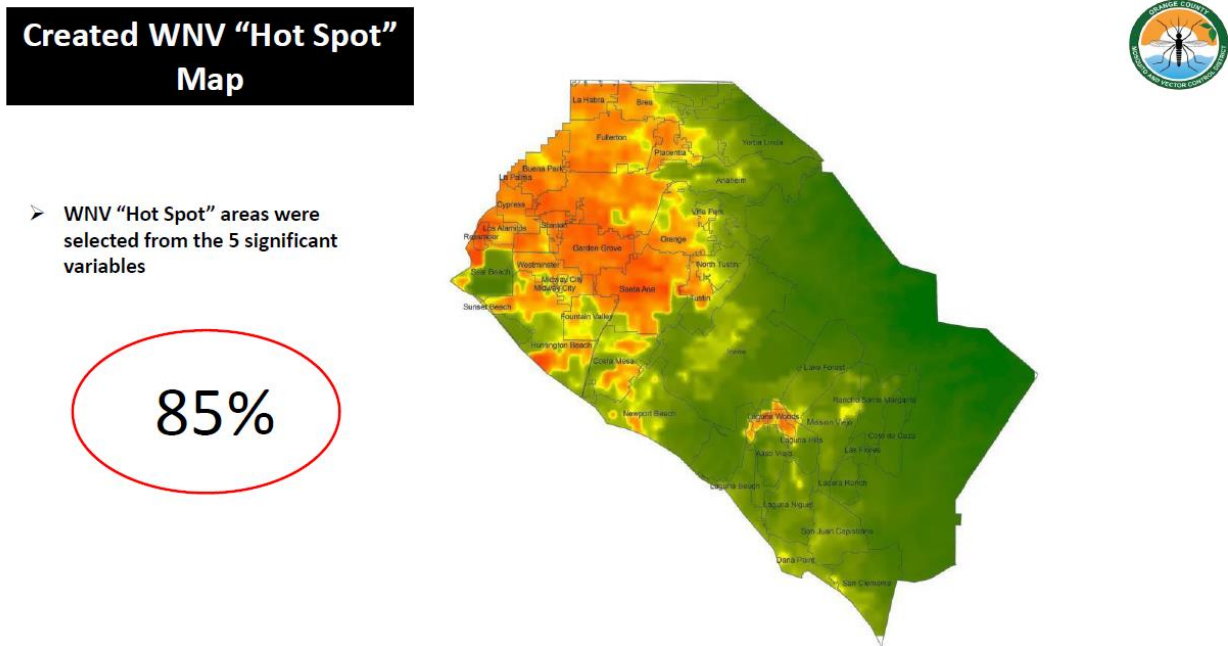
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Huntington Beach	40
Tustin	25
Buena Park	24
La Habra	24

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The area in Orange County with the highest risk of WNV, which includes the City of Santa Ana, is seen in the map below. Because WNV is a disease of birds, a bird die-off could indicate increased risk to residents. For this reason, the District maintains a dead bird surveillance program where dead birds can be reported to the District for testing. In response to the super epidemic of WNV in 2014 and 2015, the District expanded the adult mosquito control program to include the use of spraying from backpacks, trucks, and airplanes to control infected, adult mosquitoes in Orange County.

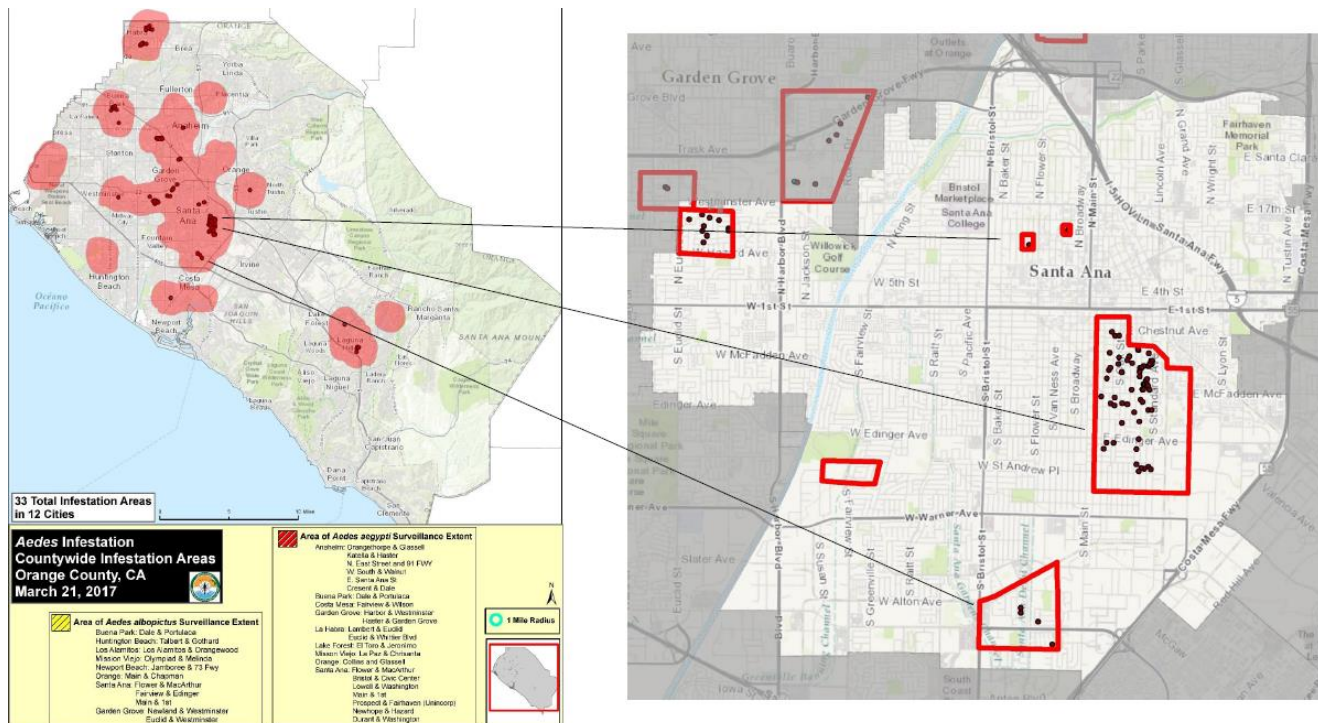
Figure 92 West Nile Virus Hotspots



Saint Louis Encephalitis (SLE) was the first (1933) recognized neuro-invasive arbovirus in the United States. Sporadic human cases have been diagnosed in southern California, and the virus and antibodies have been recovered from wild birds during surveillance studies. In 2015, SLE was detected in mosquitoes in Riverside County. The most recent, large-scale outbreaks of SLE occurred in southern California in 1983-1984 (26 cases, five in Orange County), the San Joaquin Valley in 1989 (29 cases), with sporadic cases reported in the Los Angeles Basin from 1990 to 1997. SLE virus activity has not been detected in Orange County following the introduction of WNV into the County in late 2003.

Invasive *Aedes* Diseases include **Chikungunya, Dengue, Zika, and Yellow Fever Viruses**. In 2015, invasive *Aedes* mosquitoes (*Aedes aegypti* and *Aedes albopictus*) were detected infesting multiple neighborhoods in Orange County. Before the 2015 detections, *Aedes aegypti* had never been collected in Orange County and *Aedes albopictus* had not been detected since 2004 when it was considered eradicated from Orange County. As of 2016, the invasive *Aedes* mosquito species were detected in multiple neighborhoods of Orange County. The detection of the invasive *Aedes* mosquitoes indicates that disease transmission of chikungunya, dengue, Zika and/or yellow fever is possible in Orange County.

Figure 93 Aedes Mosquito Locations in Santa Ana



Malaria is a serious infectious disease transmitted by *Anopheles* mosquitoes and is caused by single-celled animals (protists) in the genus *Plasmodia*. The species of mosquito, *Anopheles hermsi*, present in Orange County that could potentially be involved in transmission of *Plasmodia* to humans is largely restricted to wetland habitats. Major reclamation and drainage projects to produce more arable and livable land have reduced the malaria transmission potential in many areas of Orange County. However, imported malaria cases among military personnel and overseas travelers returning home have the potential to reintroduce malaria among the County's *Anopheles* mosquitoes.

Flea-borne Diseases - Flea-borne Typhus is caused by *Rickettsia felis* and/or *R. typhi*, two closely related bacteria. The cat flea, *Ctenocephalides felis*, commonly found on cats, dogs, opossums, and outdoor wildlife, is considered the primary vector of the flea-borne typhus bacteria in Southern California. Testing of small mammals and the fleas they carry by the District has demonstrated a high prevalence of flea-borne typhus bacteria in fleas (> 40%) collected from areas with human cases. From 2006-2016, over 136 human cases of flea-borne typhus were reported in Orange County.

Plague is a naturally occurring bacterial disease associated with wild rodents and fleas. The causative organism *Yersinia pestis* can be transmitted to humans through the bite of an infected flea, causing swelling ("buboes"; i.e., bubonic plague), but also infection of the bloodstream and even lungs. Plague has a very high fatality rate in humans if cases are not diagnosed and treated with antibiotics in a timely manner. Plague remains endemic in ground squirrel populations in many areas of California. Outbreaks of bubonic plague have been linked to rodent die-offs in California. Multiple dead ground squirrels, rabbits, or rats may indicate an outbreak. The California Department of Public Health, Vector-Borne Disease Section lists the Santa Ana Mountains as a plague endemic area. Plague has been detected in Orange County sporadically. In the early 1980s, ground squirrels in Tonner Canyon and Anaheim Hills tested positive for plague, and in 1998 a roof rat in the city of Orange tested plague positive. Plague in Southern California is typically associated with ground squirrels and wood rats, and is only rarely associated with roof rats. Rats, squirrels, and other small mammals from Orange County tested by the District laboratory have all tested negative since 1998.

Hantavirus Pulmonary Syndrome (HPS) is a human disease caused by a viral pathogen found in rodent urine and excrement that affects humans by attacking the lungs and producing a fatal pneumonia in nearly 40% of cases.

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Humans become infected with the virus when they inhale aerosol particles contaminated from deer mouse fecal pellets (droppings) and urine. The two strains of Hantaviruses encountered locally are the Sin Nombre Virus (SNV) and El Morro Canyon Virus. Although these strains have been found in local deer mice, no residents have been diagnosed with Hantavirus in Orange County. The deer mouse is widely distributed in neighborhoods of Orange County that border natural areas.

Novel Emerging Pathogens

With advances in travel, diseases can quickly spread throughout the world. Orange County, with its diverse population and large tourism industry, is particularly at risk for importation of diseases that may previously have been localized to other countries or continents. These diseases pose a significant hazard if they are highly transmissible from person to person and if they have significant morbidity or mortality. In the past decade, agencies have prepared to respond to multiple such diseases such as Severe Acute Respiratory Syndrome (SARS), avian influenza H5N1, Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and the Ebola Virus. The threat of a novel or emerging communicable disease appearing locally, with little or no immunity in the population and no known vaccinations or effective medical treatment methods, can have a devastating effect, spreading rapidly through the population with little treatment available.

COVID-19

In December 2019, health officials in Wuhan, China began to observe an unusual number of severe cases of pneumonia with no obvious cause. These were identified as a novel form of coronavirus (a family of viruses that attack the body's respiratory system), specifically identified as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), and became familiarly known as COVID-19, short for Coronavirus Disease 2019. Symptoms of COVID-19 vary but primarily include fever, cough, fatigue, difficulty breathing and loss of taste or smell. The disease is primarily spread when an infected person breathes, talks, coughs, sneezes, or otherwise expels infected droplets of moisture from their respiratory system and these droplets are inhaled by the next person.

Most people who contract the virus (approximately 80%) experience mild to moderate symptoms, up to a mild case of pneumonia. Others, particularly older patients or those with pre-existing medical conditions, experience severe symptoms requiring hospitalization and intensive medical care, and approximately 2-3% of patients do not survive the disease.

The World Health Organization declared COVID a worldwide pandemic on March 11, 2020. The disease spread exponentially throughout the world, reaching all countries and populations in various waves and surges. Within one year of that date, there were more than 118 million cases and 2.6 million deaths worldwide; 29 million cases and 530,000 deaths in the United States; 3.6 million cases and 54,000 deaths in California; 248,000 cases and 4,300 deaths in Orange County; and 44,000 cases and 770 deaths in the City of Santa Ana. This makes COVID-19 one of the longest and deadliest natural disasters in modern history, both locally and throughout the world.

COVID-19 cases overwhelmed hospitals and healthcare systems throughout the world, resulting in overcrowded hospitals and rationing of medical supplies and medical care. In response to the spread of the disease, health and government officials issued orders to close or significantly reduce the capacity of schools and businesses, restrict public gatherings or travel, to stay at home except for essential needs, and requiring persons to wear face coverings to prevent the sharing of exhaled air. These orders resulted in significant economic hardship and loss of jobs as businesses closed and commercial activity slowed, and in many cases were met with civil disobedience or other refusal to cooperate with public health measures.

2.4.11 Aircraft Crash

Air Travel in Orange County

Increasingly heavy air traffic over the greater Los Angeles and Orange County metropolitan area are constant reminders of the possibility of aircraft accidents occurring in or near the City of Santa Ana. Within and surrounding Orange County there are multiple airports with numerous air traffic lanes spread over the County. The airports in and adjacent to Orange County that handle the greatest amount of air traffic are as follows:

John Wayne Airport (SNA) - John Wayne Airport (SNA) is the sole commercial airport in Orange County and serves both domestic and international passengers. In 2015, over 10 million passengers boarded or departed planes at SNA, making it the 40th busiest passenger airport in the US. Almost 18,000 tons of cargo passed through the airport. General aviation operations (private planes) actually outnumber commercial operations. The airport had 248,255 flight takeoffs and landings in 2015.

SNA lies about one mile south of the southern border of the City, near the intersection of the 405 and the 55 Freeways. Aircraft arriving at SNA typically do so from the Northwest while departures are to the Southwest. Aircraft approaching for landing fly along the eastern border of the City along the 55 Freeway and aircraft lining up for this final approach frequently pass over the eastern portion of the City. During Santa Ana wind conditions the arrival and departure pattern reverses, with aircraft taking off up the 55 Freeway and out over the eastern part of the City.

Los Angeles International Airport (LAX) - In 2015, LAX was the third busiest passenger airport and seventh busiest cargo airport in the US. It ranked as the fifth busiest passenger airport and fourteenth busiest cargo airport in the world. More than 75 million passengers boarded or departed planes and the air cargo system handled more than 2.1 million tons of goods. LAX had 655,564 flight takeoffs and landings in 2015. LAX handled 70 percent of the passengers, 75 percent of the air cargo, and 95 percent of the international passengers and cargo traffic in the five-county Southern California region.

Long Beach Airport (LGB) - In 2015, 2.5 million passengers and 69,000 tons of cargo passed through the airport and the airport had 268,309 takeoffs and landings.

Fullerton Airport (FUL) - Fullerton Airport lies 8 miles north of the City adjacent to Interstate 5 and the 91 Freeway. The airport services general aviation only (no passenger or cargo aircraft) and the airport serves 600 small planes housed there.

Joint Forces Training Base Los Alamitos - This airfield is located 10 miles northwest of the City close to Long Beach Airport and is an active military base with numerous military flights taking off and landing on a daily basis. Los Alamitos Airfield is the largest Army airfield operated by the National Guard Bureau (NGB). The airfield at Los Alamitos has two all-weather runways, one 8000' in length and the other 6000' in length. Los Alamitos can accommodate most any aircraft in the flying inventory. This includes military aircraft such as the C-5, C-17, Department of Defense (DOD) charters, National Aeronautics and Space Administration (NASA) aircraft, and fighter aircraft. The President's Boeing VC-25A (B-747 named Air Force One) along with the United States Marine Corps (USMC) Presidential Helicopter Flight Detachment (HMX-1), use the Los Alamitos Joint Forces Reserve Training Center Airfield and its facilities for any visits to the Orange County area. Ramp space can accommodate and house up to ten C-5 aircraft without difficulty. At present, approximately 30 helicopters are stationed at the Los Alamitos Joint Forces Reserve Training Center Airfield as well as several fixed-wing aircraft assigned to the United States Army Reserve. The airfield includes a fully staffed Army air traffic control tower, and a jet fuel farm for aviation refueling.

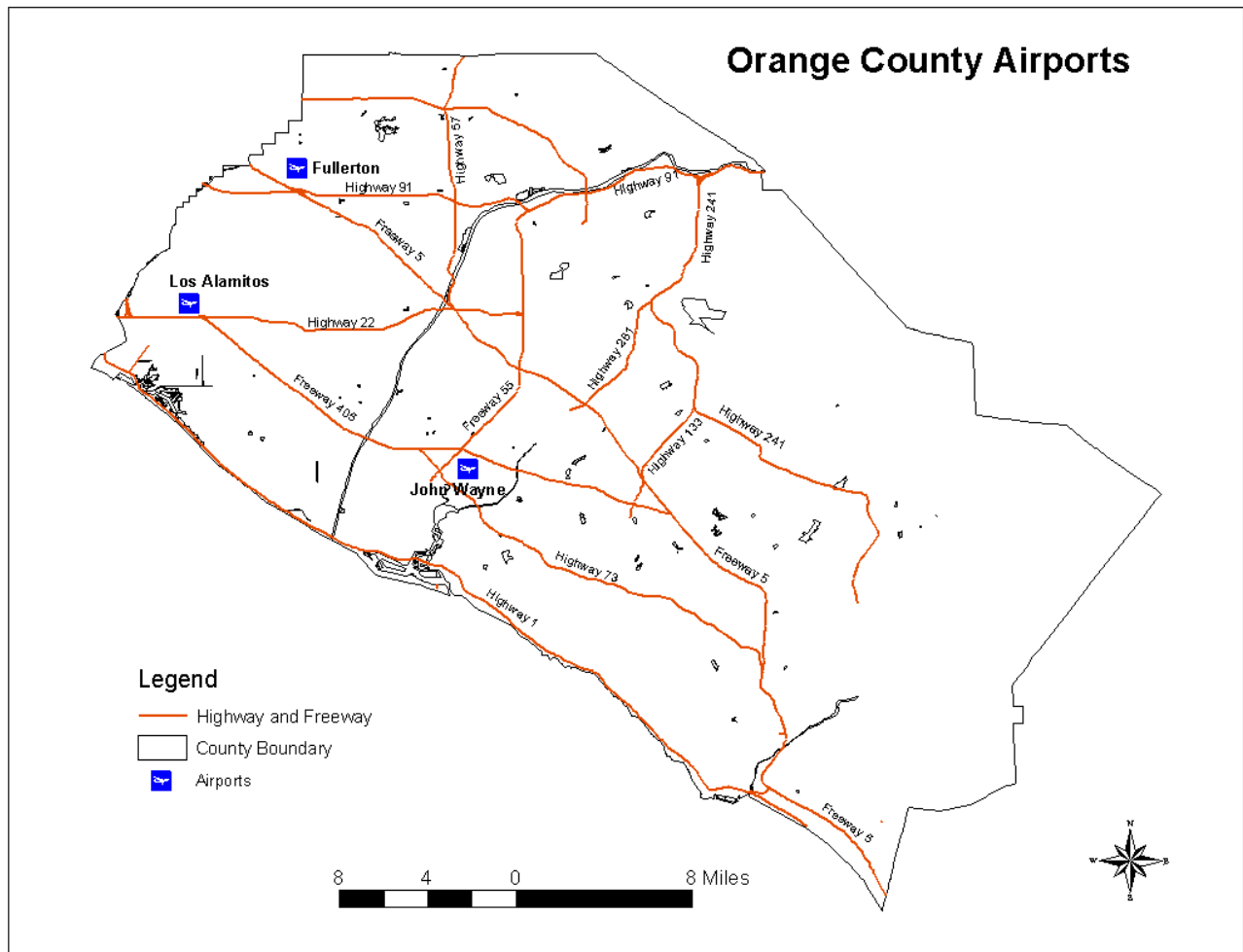
Marine Corps Air Station Camp Pendleton – This MCAS is adjacent to the South Orange County boundary line. This installation is home to a large number of aircraft, predominately helicopters, which frequently transit through the airspace over Orange County.

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Aircraft flying over Orange County are in the Los Angeles Terminal Control Area (TCA). The TCA is airspace restricted to large, commercial airliners. Smaller aircraft desiring to transit the TCA may do so by obtaining Air Traffic Control clearance. Pilots operating small aircraft often rely on geographical landmarks, rather than charts, to indicate their locations. If a pilot is unfamiliar with the geographical landmarks of the region, he/she may misinterpret a particular landmark and inadvertently enter the restricted TCA airspace. This misunderstanding could result in a mid-air collision.

Figure 96 Orange County Airports



Impacts of Aircraft Crashes

A major air crash that occurs in a heavily populated residential or business area can result in considerable loss of life and property. It can be anticipated that few, if any, airline passengers will survive a major air crash due to the velocity of impact. The impact of a disabled aircraft as it strikes the ground creates the likely potential for multiple explosions resulting in intense fires that have the potential to cause injuries, fatalities, and the destruction of property over a widespread area around the impact point. The intense fires, until controlled, will limit search and rescue operations. Perimeter security and police barricades will be needed to block off a significant area around the crash. Crowds of onlookers and a significant media presence will have to be managed.

Families may be separated from each other and a family assistance center should be established at a location convenient to the public. It can be anticipated that the mental health needs of survivors, responders, and the surrounding residents will greatly increase due to the trauma associated with such a catastrophe. A coordinated response team, comprised of behavioral health professionals, should take a proactive approach toward identifying and addressing mental health needs stemming from any traumatic disaster.

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In incidents involving civilian aircraft, investigators from the National Transportation Safety Board (NTSB), with support from the Police Department, will have jurisdiction over the crash area (the military has investigative jurisdiction over any incident involving military aircraft) and an investigation into the cause of the crash will be completed before the area is released for cleanup. Because aircraft crashes often occur with a very high-speed impact into the ground, often followed by intense fire, the bodies of persons killed in the crash, either on the aircraft or on the ground, may be substantially destroyed. This will require a lengthy and detailed process to recover all of the human remains and any personal effects that can be used to identify them before cleanup can begin. The clean-up operation may require removing large debris, clearing roadways, demolishing unsafe structures, and towing demolished vehicles. This combined investigation, recovery of remains and cleanup may take days or weeks and would result in extended or long-term road closures, evacuated residences and closed schools and businesses in the affected area.

Local Aircraft Crash Events

On November 23, 1968, a twin-propeller commuter aircraft flying from LAX into John Wayne Airport encountered heavy fog on final approach to the airport. The aircraft struck a 30-foot-tall light standard and crashed across all six lanes of the 55 Freeway in the area of MacArthur Boulevard, killing all 9 persons aboard, two pilots and seven passengers.

On February 17, 1981, Air California Flight 336, a Boeing 737 flying from San Jose, carrying 105 passengers and 5 crew members, was cleared to land at SNA and began to land. Air traffic controllers realized another aircraft had been cleared for takeoff on the same runway and both planes were ordered to abort. Flight 336's pilot retracted the landing gear and attempted to ascend, but the plane slammed onto the runway, skidded 2,000 feet, broke apart and caught fire. After emergency evacuation, all passengers and crew survived, though four were seriously injured and 30 more suffered lesser injuries.

On December 15, 1993, a twin-engine corporate jet chartered by the In-and-Out burger chain was approaching John Wayne Airport and suddenly lost power over the City. The plane slammed nose first into a field next to the Crevier BMW dealership at the Santa Ana Auto Mall on Edinger Avenue. Both pilots and all three passengers were killed.

On November 30, 1996, a small, private twin-engine jet carrying one pilot and two passengers took off from John Wayne Airport with the boarding ladder mistakenly still attached to the plane. The pilot quickly attempted to circle back to the airport but lost control and crashed through the roof of a medical supply warehouse on McGaw Avenue in the City of Irvine, near the intersection of MacArthur Boulevard and the 55 Freeway. All three aboard were killed and the warehouse was destroyed in the fire, but fortunately it was a Saturday and no persons on the ground were injured.

On June 30, 2017, a private, twin-engine plane suffered engine failure immediately after takeoff from SNA and attempted to return to the airport, but was unable to maintain altitude and crashed onto the 405 Freeway just short of the runway, bursting into flames. The two occupants were seriously injured but survived, and with considerable luck, no motorists on the crowded freeway suffered serious injury.

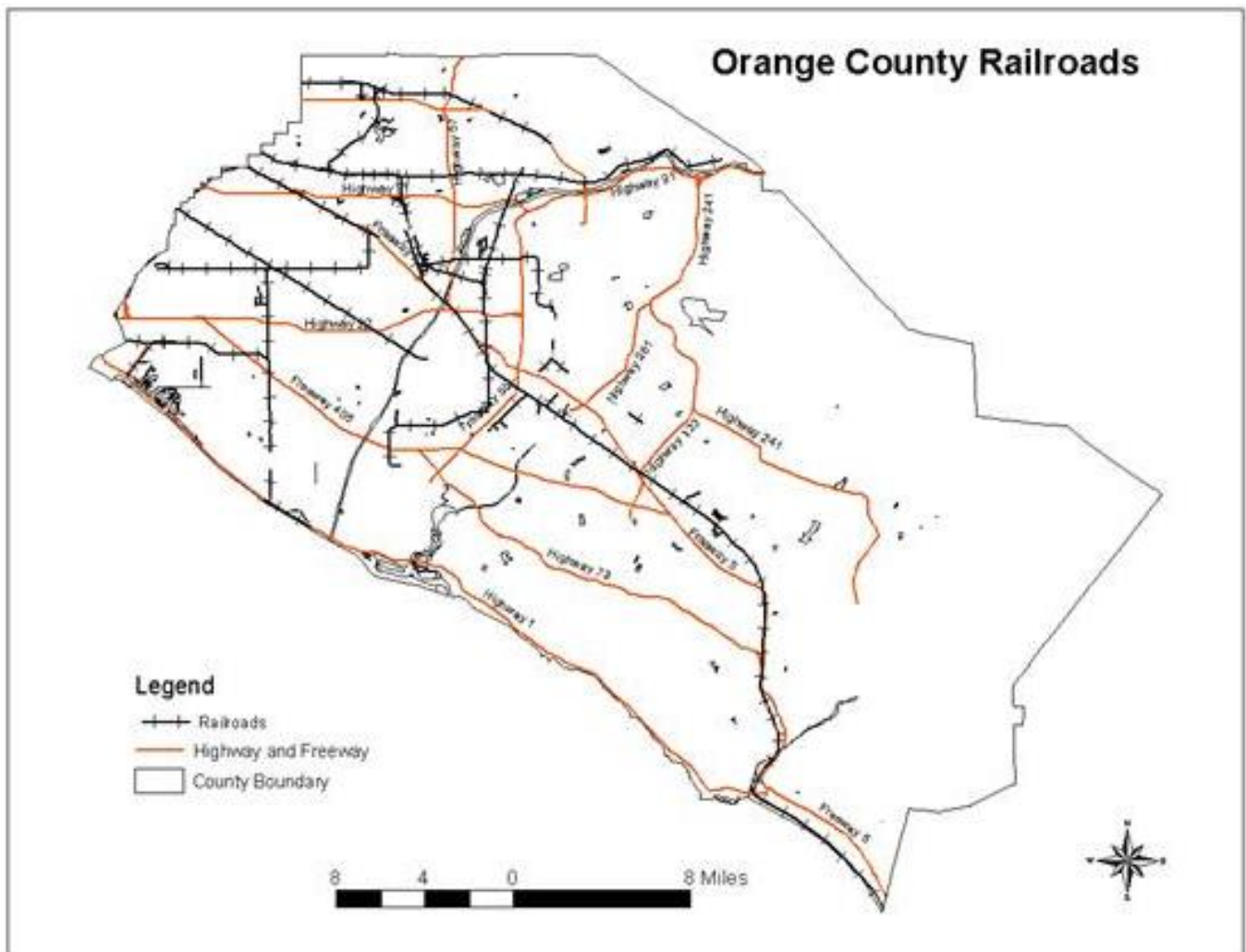
On August 5, 2018 at approximately 12:30 PM, the pilot of a private Cessna 414 aircraft flying from Concord, California declared an emergency of unknown type upon approach to John Wayne Airport. As air traffic controllers were preparing emergency landing instructions, the aircraft nosedived into the parking lot of a retail-shopping plaza on the southwest corner of Bristol Street and MacArthur Boulevard, narrowly missing the occupied shopping center but impacting parked vehicles in the lot. All five occupants of the aircraft were killed, but no persons on the ground were injured.

2.4.12 Railroad Crash/Derailment

Rail Travel in Orange County

Freight and passenger trains travel the City and County 24 hours a day, seven days a week, serving commerce and personal travel needs. 117 miles of track bisect Orange County in north-south and east-west directions with 270 at-grade crossings and 94 grade-separated crossings for highways, roadways and waterways

Figure 98 Railroads in Orange County



Four rail carriers operate approximately 100 daily trains through the county, traveling at speeds up to 70 MPH. Those passenger and cargo carriers include:

- Burlington Northern/Santa Fe (BNSF)- Cargo
- Union Pacific - Cargo
- Amtrak- Passenger
- Metrolink - Passenger

Currently, the Burlington Northern Santa Fe Railway mainline between Los Angeles and San Bernardino counties carries an estimated 75 daily freight trains through parts of northern Orange County, in the cities of Yorba Linda, Anaheim, Buena Park, Fullerton and Placentia. By 2025, this line will carry an estimated 125 daily freight trains according to the Orange County Transportation Authority. Along the Los Angeles/San Diego Rail Corridor, which runs north and south through the City of Santa Ana and county, daily freight train traffic is expected to

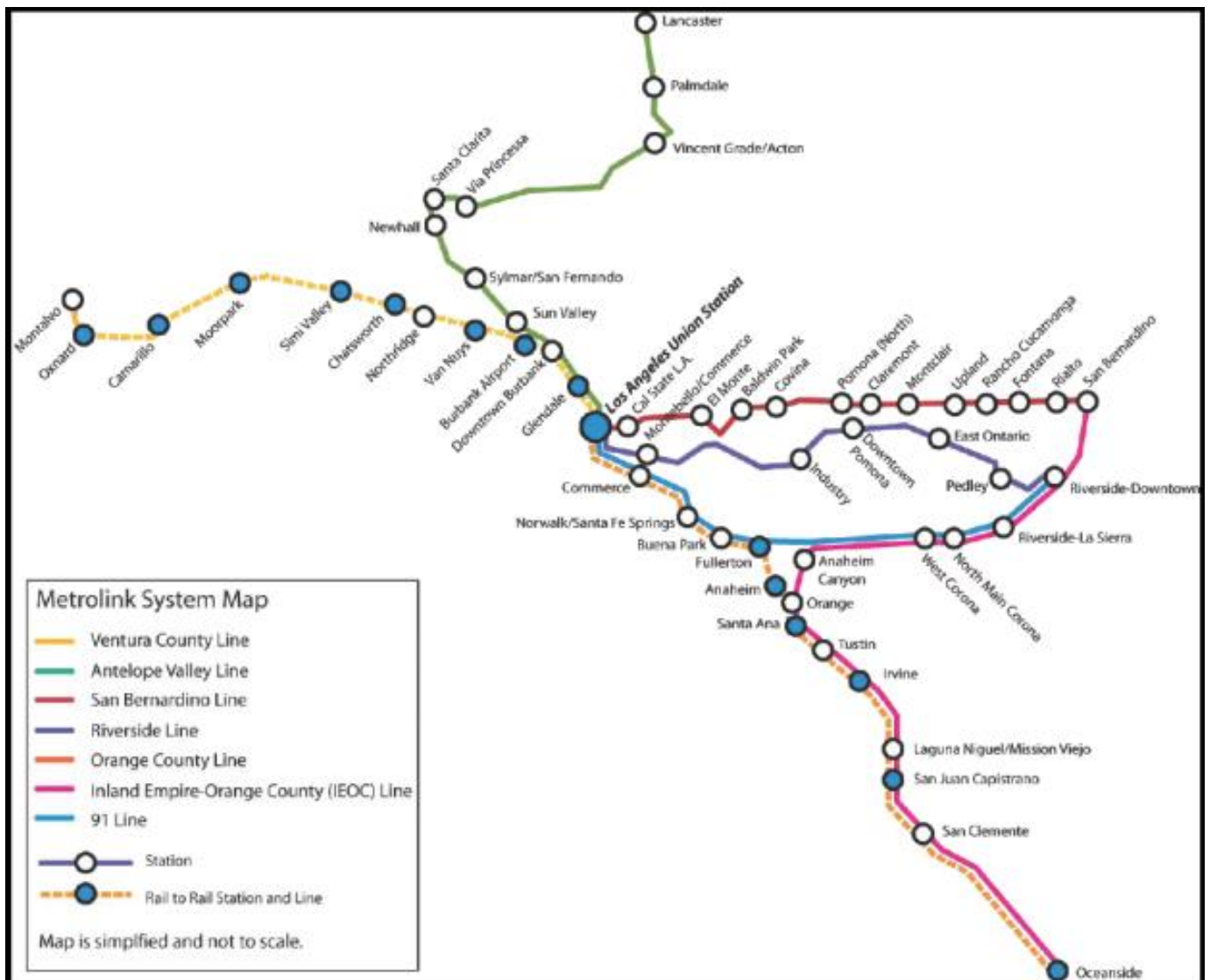
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increase from six to 12 trains by 2025. In almost all cases, the contents of these trains are unknown to the City and county or public safety responders.

The Amtrak Pacific Surfliner travels through Santa Ana with 12 daily trains; as of 2014, the train route has seen approximately 500 boardings/alightings per day and 184,000 passenger boardings/alightings per year in the City. Each Amtrak passenger car can hold anywhere from 65 to 95 passengers. Metrolink carries approximately 30 daily trains through the City, with approximately 800 passenger boardings/alightings per day. A Metrolink commuter passenger car can hold 147 passengers sitting and many more standing.

Figure 99 Metrolink Rail Routes



There are impediments to emergency response for rail emergencies including inaccessible areas, limited firefighting water supply along tracks, right-of-way tenants or homeless encampments, and utilities (gas, water, electricity and pipelines) located along tracks. Additionally, a rail emergency may include a hazardous material or Mass Casualty Incident (MCI) or possibly both.

Impacts of Railroad Crashes

A major train derailment occurring in a populated area can result in considerable loss of life and property. As a train leaves its track, there is no longer any control as to the direction it will travel. Potential hazards include overturned rail cars, direct impact into buildings, or entering into roadway vehicle traffic. Each of these hazards encompasses many threats, including injury and loss of life to train passengers, individuals in adjacent buildings or vehicles, or other individuals in the vicinity of the accident; fire or explosion; or release of hazardous materials.

Bakken oil, a lighter type of crude oil, similar to gasoline, contains higher levels of combustible gases, making it potentially more flammable than other kinds of crude oil. Bakken crude has received national attention since an increase in Bakken train explosions around the country prompted the federal government to write stronger regulations on rail transport, including a proposal to require sturdier tank cars for oil. The railroad companies, which fall under federal regulations, do not provide information to state and local officials about shipments of this or other toxic, volatile and explosive materials as they travel through Orange County.

In 2014, California received 1.2 million barrels of crude from North Dakota by rail, according to the California Energy Commission. Fires involving Bakken crude provide a serious challenge to first responders due to its heat, intensity and rapid rate of combustion. Statewide, more protocols are being developed on the appropriate ways to fight this new train accident hazard.

A response to a rail emergency can be very complex depending on the incident location. Response may require the coordination and efforts from local, county, state and federal jurisdictions, and from private agencies. Additionally, federal statutes and regulations place the responsibility for investigation and survivor assistance with the rail passenger carrier and specific federal agencies. National and local economies rely on rail traffic. The recovery time involved in clearing a rail emergency may be a significant hardship to the economic well-being of the community.

Railroad Crash Events

According to the California Office of Emergency Services, there have been 14 major train accidents affecting 12 communities since 1950. Additional significant train accidents, derailments, fires and hazardous material releases have occurred in California in the past 40 years that resulted in multiple deaths, numerous injuries and property damage.

Roseville Train Explosion

A dramatic example in California history was the major explosion and chemical plume release that occurred in April 1973 in the Roseville railroad yard when 6,000 bombs on a train bound for the Concord Naval Weapons Station detonated after a railroad car caught fire. Although no one was killed, the blast reportedly injured about 100 people and damaged 5,500 buildings, some more than a mile away.

Duffy Street Derailment, San Bernardino

On May 12, 1989, a 6-locomotive/69-car Southern Pacific freight train picked up speed while descending the Cajon Pass in Southern California. The train reached a speed of 110 miles per hour on a curve designed for no more than 40 miles per hour. The train derailed and plowed into a residential area on Duffy Street. The conductor, head-end brakeman, and two residents were killed in the crash. Seven homes were destroyed, as was the entire train. During the cleanup effort, an underground 14-inch high-pressure gasoline transit pipeline suffered undetected damage. On May 25, 13 days after the train derailment, the pipeline burst, showering the neighborhood in gasoline and igniting a large fire that killed two people and destroyed 11 more homes. The total property damage was \$14.3 million. Many residents moved after this, and homes are no longer allowed to be built next to the rail lines. Investigations determined several causes that contributed to the derailment: a miscalculation of the weight of the freight, which was underestimated by 40 percent; lack of dynamic brakes on three of the six locomotives; and train engineer error in activating the emergency brake, which cancelled the dynamic brakes on the functioning three locomotives.

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Placentia Crash

On Tuesday, April 23, 2002, about 8:10 AM, an eastbound Burlington Northern/Santa Fe Railway freight train collided head on with a standing westbound Southern California Regional Rail Authority passenger train at Control Point Atwood in the City of Placentia. Emergency response agencies reported that 162 persons were transported to local hospitals. There were two fatalities. Damage was estimated at \$4.6 million.

Glendale Derailment

On January 26, 2005, a southbound Metrolink commuter train collided with a sport utility vehicle (SUV) that had been abandoned on the tracks near the Glendale-Los Angeles city boundary. The train jackknifed and struck trains on both sides of it, one a stationary freight train and the other a northbound Metrolink train traveling in the opposite direction. These collisions resulted in 11 deaths and almost 200 injuries. Subsequent criticism focused on the issue of train configuration. Many commuter trains use a "pusher configuration" to avoid turnaround maneuvers and facilities required to reverse a train's direction. This means the trains are pushed from the back by the locomotive. There were assertions that this type of configuration made the accident worse and claims that if the engine had been in the front, the train might not have jackknifed and caused the second Metrolink train to derail. To increase rider safety, Metrolink temporarily roped off the first cars in all of their trains and allowed passenger seating in the second car and beyond. Metrolink gradually modified this policy. As of 2007, the line permitted passengers to sit in a portion of the first car when in "push mode," but did not allow seating in the forward-most section of the first car.

Chatsworth Derailment

The September 12, 2008 Chatsworth train accident resulted in 25 deaths and injuring more than half the train's passengers and also spawned significant changes to national rail safety standards. The head-on collision occurred in Chatsworth, a neighborhood of Los Angeles located at the western edge of the San Fernando Valley, involving a Metrolink commuter train and a Union Pacific freight train. All three locomotives, the leading Metrolink passenger car, and seven freight cars derailed. According to the National Transportation Safety Board (NTSB), the Metrolink train engineer most likely caused the collision because he was distracted by sending text messages while on duty. He failed to obey a red stop signal that indicated it was not safe to proceed from the double-track into the single-track section and, thus, collided head-on with the freight train that was traveling on the same single-track section from the opposite direction.

2.4.13 Drought/Water Failure

Water Supply and Water Needs

Water supply in the city of Santa Ana is provided by the Santa Ana Public Works Agency's Water Resources Division. The City delivers an average of 33 million gallons per day, over 12 billion gallons per year, to approximately 45,000 customers. (A customer refers to a billing account, not an individual person, so each "customer" may serve a whole household or an entire business, school or other facility.) The City supplies water to the entire residential population of the City (more than 342,000 people) as well as serving approximately 9,000 non-residential, business or industrial customers.

Domestic water supply (clean drinking water) is one of the most vital necessities that every human being depends on every day to sustain life and health. Residential consumers depend on water to drink, to prepare food, for personal health and hygiene, and to clean homes and belongings. Pets and service animals are just as dependent on daily drinking water. Most businesses, offices, retail stores, schools and other non-industrial water customers have similar daily water needs and many cannot function without a continual water supply.

Hospitals and health care facilities depend on uninterrupted water supply to (in addition to the residential uses listed above) maintain surgery, laboratory and other medical treatment functions and to perform lifesaving medical care. For example, persons requiring kidney dialysis may require the procedure every one to three days and missing a dialysis session can cause death within about one day, and up to 100 gallons of water are required to perform a dialysis treatment.

Another primary use of water supply is firefighting. Firefighters depend on water supplied to fire hydrants throughout the City, at sufficient pressure, to combat structural or other fires. A large structure fire may require hundreds of thousands of gallons of water to fully extinguish.

Santa Ana receives its water supply from a combination of groundwater wells (approximately 75% of supply) and imported water (approximately 25% of supply). Water supply to Orange County as a whole is split close to 50%-50% between groundwater and imported water, with south Orange County almost entirely dependent on water imported from outside the region.

Groundwater wells accumulate rainfall and other water runoff that drains or is absorbed into the ground. The City owns 20 groundwater wells, which can provide up to 74 million gallons per day. In 2015, the City withdrew over 8 billion gallons from its groundwater wells.

The City receives its imported water from the Metropolitan Water District of Southern California (MWD). MWD is a multi-jurisdictional, cooperative agency that coordinates the delivery of water imported to southern California and distributed throughout Orange, Los Angeles, Ventura, San Bernardino, Riverside and San Diego Counties. MWD imports water from two primary sources: from the Colorado River to our east and from the California Aqueduct which brings water primarily from snowpack runoff from the Sierra Nevada Range in northern California. MWD can provide up to 87 million gallons per day and the City imported approximately 2.6 billion gallons in 2015.

The City can store up to 49.3 million gallons in 10 City-owned tanks or reservoirs, and utilizes seven pumping stations and 444 miles of water mains to distribute the water throughout the City.

Causes of Water Outages

Three primary causes could prevent the City from delivering water to consumers: drought, damage to water supply lines, and water contamination.

Drought - Drought is the largest threat to water supply. Unlike most natural disasters, drought is not a sudden, catastrophic occurrence; it is a gradually progressive event. Droughts occur over several years and it is often difficult to establish when they begin and end. California rarely has an "average" rainfall year; rainfall frequently varies from very wet to very dry years. Impacts of drought vary from region to region and among different populations, such as residents, industries and agriculture. Drought can be defined in different ways: by precipitation levels, snowpack depth, soil moisture or reservoir or groundwater levels. Generally, drought is a

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deficiency in precipitation, usually over several seasons, which proves insufficient to meet the demand that people place on the water supply.

The U.S. Drought Monitor is a weekly map of drought conditions that is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration and the current map can be located at www.droughtmonitor.unl.edu. U.S. Drought Monitor maps provide a consolidated depiction of national drought conditions based on a combination of drought indicators and field reports. The assessment can be broken out by state or region.

The Drought Monitor summary map identifies general drought areas, labeling droughts by intensity, with D1 being the least intense and D4 being the most intense. Drought intensity categories are based on five key indicators, numerous supplementary indicators including drought impacts, and local reports from more than 350 expert observers around the country. The drought severity classification table shows the ranges for each indicator for each dryness level:

Drought Severity Classification							
Category	Description	Possible Impacts	Ranges				
			Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Short and Long-term Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30	21-30	-0.5 to -0.7	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20	11-20	-0.8 to -1.2	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10	6-10	-1.3 to -1.5	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5	3-5	-1.6 to -1.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2	0-2	-2.0 or less	0-2

Historical Drought Events – The State of California averages 23 inches of precipitation (snowfall in the mountains and rainfall in other areas) per year and Orange County averages about half that with 12-14 inches per year. Approximately 75% of precipitation falls between November and March and approximately 50% falls in the months of December, January and February. Significantly reduced precipitation in these fall and winter months is the primary cause of drought. Since actual precipitation varies widely from year to year, drought is usually a cumulative effect of several dry years. California has experienced five significant multi-year drought periods in the last century. With the progressive effects of climate change altering precipitation patterns and causing warmer temperatures, combined with the constantly growing population of Southern California consuming more and more of the available water supply, water shortages may occur more often or more severely in future years.

1929-1934 - This drought occurred during a decade-long dry period associated with the “Dust Bowl” conditions that spanned the western United States in the early 1930’s. 1931 was the second driest year in recorded state history. Because of the annual variability in precipitation levels, precipitation is often measured in three-year periods to provide more of an average. Of the top 10 driest three-year periods on record, five occurred between the years 1922 and 1933 (1922-24, 1923-25, 1924-26, 1929-31 and 1931-33). Though this drought was severe by hydrological measures, its impact was limited by the much smaller population, agriculture and urban development levels of the state at that time period.

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1976-1977 – Though only spanning two years, this drought was severe in measure. The winter of 1976 had only one-half normal precipitation and the winter of 1977 had only one-third normal precipitation, making them the fourth and first driest years in history, respectively. Average storage levels in water reservoirs throughout the state dropped to 57% of average in 1976 and to 37% in 1977.

1987-1992 – From 1987 to 1992, California again experienced a serious drought, the first extended, multi-year drought since the 1930's, due to significantly lower precipitation. 1990, 1991 and 1992 were the seventh, fifth and tenth driest years on record. After four years of drought and three winter months of meager precipitation, California's water prospects looked bleak at the start of 1991. Reservoir levels had dropped to 40% of average, the lowest since 1977, the driest year on record. Other supply systems were suffering more major shortages, which led to stringent water rationing and severe cutbacks in agricultural production and threatened the survival of permanent crops.

2007-2009 – California experienced three consecutive dry years between 2007 and 2009, the 12th driest three-year period in history. This led to the first-ever statewide State of Emergency Proclamation due to drought. This drought was significant in that it was the first time there were significant cutbacks in water deliveries from Northern California to Southern California through the California Aqueduct System, where Southern California receives a substantial portion of its water supply, since its construction.

2012-2016 – Drought conditions began over the western United States in 2011 and grew progressively worse over the following five years. The years 2012-2014 were the single driest three-year period ever recorded. 2014 was the third driest single year in history and the low precipitation continued into the 2015 and 2016 water years. This time period also coincided with record warmth, with 2014, 2015 and 2016 as the three warmest years ever recorded for Santa Ana:

Santa Ana temperature climate

Maximum 1-Year Mean Avg Temperature for SANTA ANA FIRE STN			
Rank	Value	Ending Date	Missing Days
1	69.4	2014-12-31	0
2	69.4	2015-12-31	0
3	68.3	2016-12-31	1
4	67.4	1997-12-31	16
5	67.3	2009-12-31	11
6	67.1	1992-12-31	12
7	66.8	2012-12-31	2
8	66.8	2008-12-31	13
9	66.7	2006-12-31	12
10	66.5	1984-12-31	15
Period of record: 1916-05-17 to 2017-05-31			

The warmer weather means less snowfall and a quicker, earlier runoff of spring snowmelt, which is a major source of water supply for the state. This resulted in the second-ever statewide State of Emergency Proclamation due to drought, issued in January 2014 and not lifted until April 2017, after a rainy winter. The following charts, prepared by the National Weather Service San Diego Office, indicate that between January 2011 and September 2016, the City of Santa Ana had lost the equivalent of three full seasons of rainfall:

5 year precipitation since **January 2011**

September 30, 2016

Station 5 year precipitation	Total Deficit Calendar Year	2015-16 % Annual	30-y Annual average	Lost precipitation
San Diego (SAN)				
44.28	14.85 inches	8.18 or 79%	10.34	1 ½ season
Santa Ana (Fire stn)				
37.40	40.38 inches	5.19 or 38%	13.63	3 seasons
Riverside (Fire stn)				
36.58	22.60 inches	5.59 or 54%	10.33	2 seasons
Palomar Mtn				
115.82	59.15 inches	18.59 or 62%	30.20	2 seasons
Idyllwild				
111.06	48.01 inches	23.06 or 84%	27.41	1 ½ season
Palm Springs				
15.51	13.19 inches	3.69 or 76%	4.83	2 ½ seasons

And by January 2017, the City of Santa Ana was still behind by almost three full seasons of rainfall:

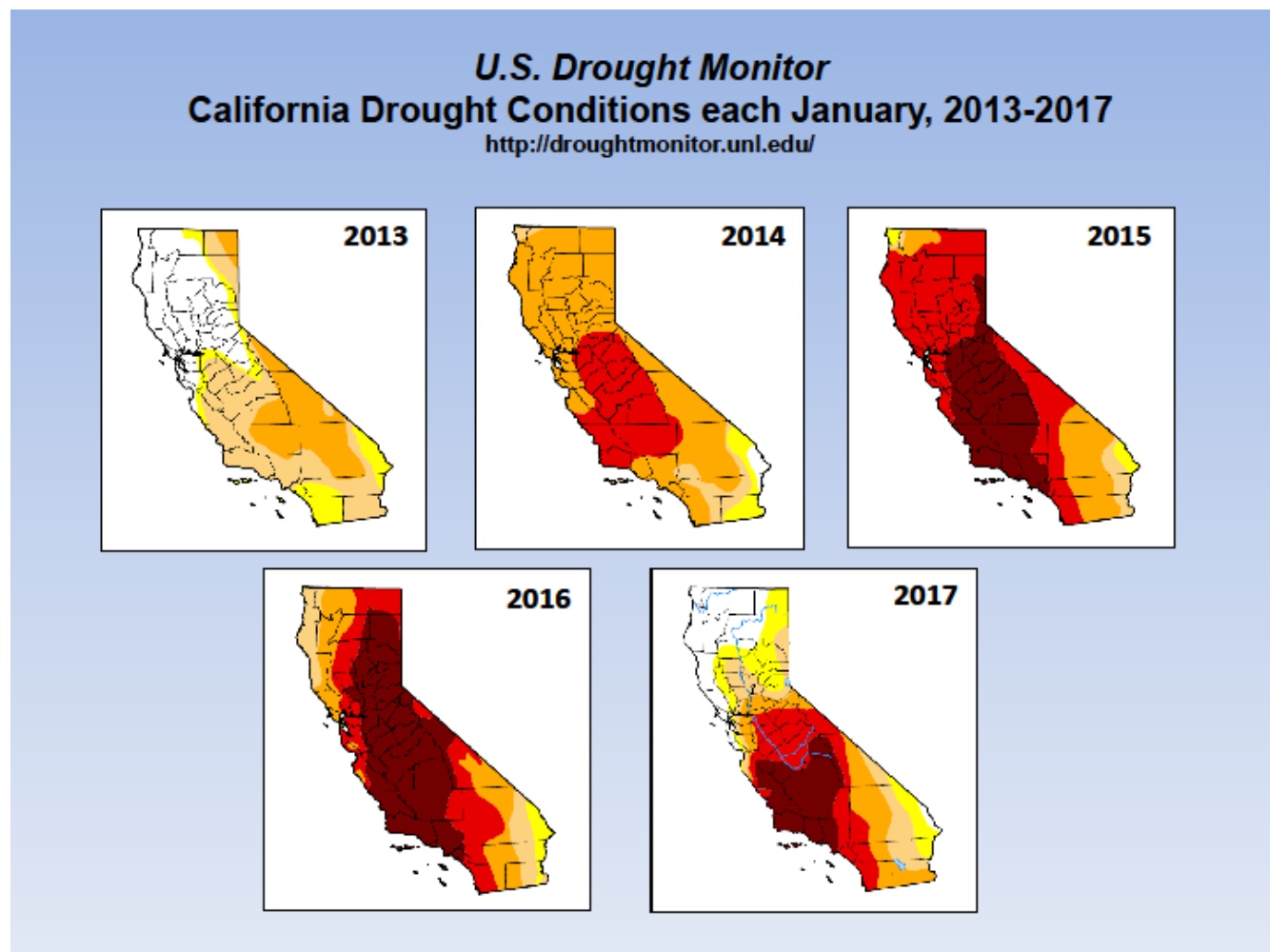
6 year precipitation since **January 2011**

January 18, 2017

Station 6 year precipitation	Total Deficit Calendar Year (inches)	2015-16 % Annual	Current water year Since Oct 1	30-y Annual average	Lost precipitation
San Diego (SAN)					
50.24	11.80	8.18 or 79%	5.96 (58%)	10.34	1 season
Santa Ana (Fire stn)					
46.41	37.89	5.19 or 38%	8.95 (66%)	13.63	2 ½ seasons
Riverside (Fire stn)					
43.89	18.09	5.59 or 54%	7.31 (71%)	10.33	1 ½ seasons
Idyllwild (5000 ft)					
124.59	39.87	23.06 or 84%	13.11 (55%)	27.41	1 ½ seasons
Palm Springs					
17.30	11.68	3.69 or 76%	2.46 (51%)	4.83	2 ½ seasons

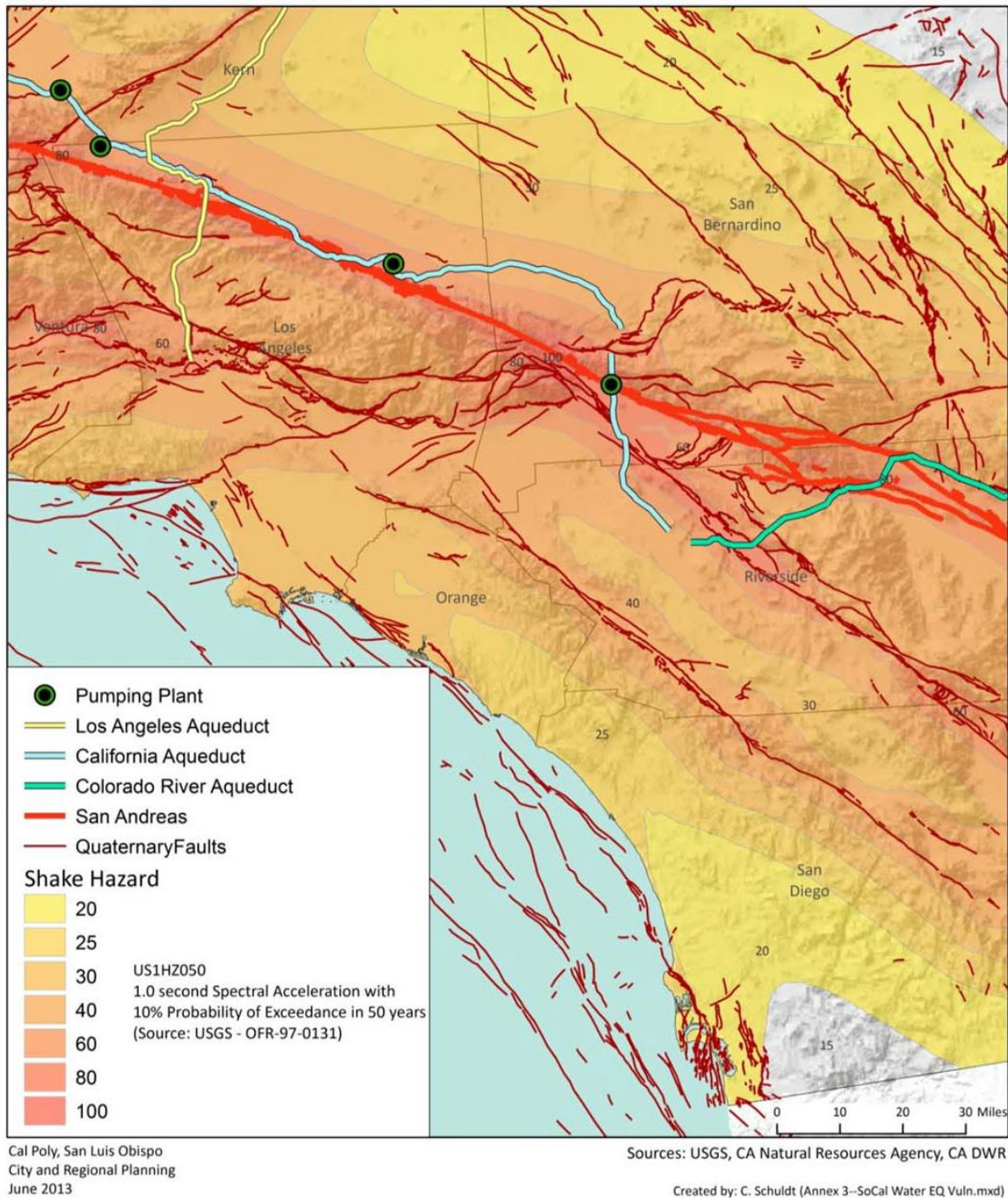
The following maps, courtesy of NDMC-UNL, depict the progression of drought conditions 2012-2017:

Figure 106 California Drought Conditions 2012 through 2017



Damage to Water Supply Lines – After drought, the next most likely threat to the water supply is damage to water supply infrastructure. The City of Santa Ana imports about 25% of its water supply. However, Orange County imports approximately 50% and southern California imports approximately 2/3 of its water supply. These imports come primarily from northern California and from the Colorado River, through a network of aqueducts, canals and tunnels throughout the central and southern parts of the state. These include the California Aqueduct from the north, the Colorado River Aqueduct and Coachella Canal from the east, and the Los Angeles Aqueduct, which brings water to the City of Los Angeles from the Owens Valley, as well as numerous reservoirs and pumping stations to transport the water. The San Andreas Fault, southern California’s largest and most powerful earthquake fault, crosses or intersects with these water systems in 22 separate locations:

Figure 107 Southern California Water Resources Vulnerability to Earthquakes



A major rupture of the southern San Andreas Fault could span more than 200 miles, severing all of these water lifelines simultaneously. This damage would require significant re-construction projects to restore the flow of water, which would likely take months to complete, even with expedited, emergency repair efforts.

There is an estimated 6-month supply of water for southern California stored on this side of the San Andreas Fault. However, an earthquake of this size would likely cause damage to local water storage and distribution infrastructure as well, resulting in substantial losses to this locally stored water supply. Post-earthquake firefighting efforts would also consume large quantities of local water supply. These combined effects could quickly consume the available water, potentially causing widespread water shortages and rationing throughout southern California.

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Water Supply Contamination – Widespread contamination of the local water supply is perhaps the least likely threat to our water; however, several types of contaminants could enter the water supply. These include:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, agricultural application, and septic systems.
- Radioactive contaminants that can be naturally occurring or be the result of oil and gas production and mining activities.

There are no known, significant sources of any of these contaminants near the City's water supply, so a substantial loss of water due to this cause is unlikely. However, the City does receive 75% of its water supply from local groundwater, so the significant emergence of a contaminant, through either an accidental or naturally occurring spill or release, or an intentional act of sabotage or terrorism, could impact the availability of safe drinking water.

Impacts of Water Outages

Drought, or other loss of water supply, is one of the few hazards that has the potential to affect every person in the City and County at the same time. These impacts include restrictions on all residential, commercial or other uses of water; agricultural losses and associated economic losses; economic impacts to tourism and recreation industries; and increased costs for water.

The City does not have significant agricultural operations but the loss of agricultural crops or animals elsewhere in the state would impact the availability of food supplies and consumer costs for food. Water-dependent businesses, such as car washes, restaurants, nurseries, and recreation may be forced to shut down, with the associated loss of employment and City tax base.

Income loss to the City's Water Department from reduced consumption could result in the need to increase water rates in order to cover fixed operational costs. As water supply becomes scarcer, the need for deeper wells, increased imports or the development of other sources of supply could also result in significantly higher operational costs.

Water-rationing, bulk-water hauling and mass distribution of bottled water may be required. Ultimately if a severe, multi-year shortage existed for long enough without relief, it could culminate in an inability to provide sufficient food and drinking water to sustain the population, resulting in a forced migration of people away from the area to other regions or states.

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2.4.14 Hazardous Materials

Hazardous Materials Defined

Various definitions of hazardous materials exist among different regulatory or response agencies. The National Fire Protection Association defines hazardous materials as “Any solid, liquid, gas, or mixture thereof that can potentially cause harm to the human body through respiration, ingestion, skin absorption, or contact.”

A hazardous material is defined in California’s State Hazardous Materials Incident Contingency Plan as “A substance or combination of substances which, because of quantity, concentration, physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in deaths or serious illnesses; and/or pose a substantial present or potential hazard to humans or the environment.”

The California Health and Safety Code Section 25501.m defines hazardous materials as “Any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human and environmental health and safety if released into the workplace or the environment.”

Types or Examples of Hazardous Materials

The U.S. Department of Transportation regulates the transportation of hazardous materials and categorizes them into nine classes, which include:

Class	Title	Common Examples	Common Effects
1	Explosives	Dynamite, TNT, Blasting agents, Nitro-glycerin, Fertilizers	Explosion, blast or projectile hazards
2	Flammable and Toxic Gases	Refrigerants, Butane, Propane, Carbon Dioxide, Insecticides, Liquefied Petroleum Gas	Fire, explosion; burns to skin, lungs, eyes or other tissues; asphyxiation or suffocation
3	Flammable and Combustible Liquids	Gasoline, Diesel, Ethanol, Paints, Crude Oil/Petroleum, Solvents, Cleaners	Fire; explosion; burns to skin, lungs, eyes or other tissues; asphyxiation or suffocation
4	Flammable Solids, Spontaneously Combustible Materials and Water-Reactive Substances	Phosphorous, Sulfur, Flammable Metals (Lithium, Aluminum, Magnesium, Zinc)	Fire, explosion, explosion on contact with water; burns to skin, lungs, eyes or other tissues; asphyxiation or suffocation; spontaneous re-ignition
5	Oxidizing Substances and Organic Peroxides	Hydrogen Peroxide, Ammonium Nitrate Fertilizers, Lithium Ion batteries	Fire; explosion, explosion on contact with water; accelerated combustion; burns to skin, lungs, eyes or other tissues; asphyxiation or suffocation
6	Toxic and Infectious Substances	Arsenic, Cyanides, Disinfectants, Lead, Mercury, Herbicides, Pesticides, Disease Organisms, Medical Waste	Fire, explosion, explosion on contact with water; burns to skin, lungs, eyes or other tissues; asphyxiation or suffocation; exposure to infectious diseases
7	Radioactive Materials	Nuclear Fuel, Nuclear Waste, Medical Waste	Exposure to radiation, burns
8	Corrosive Substances	Acids, Bases, Alkalis, Solvents, Cleaners, Industrial/Research chemicals	Burns to skin, lungs, eyes or other tissues; corrodes or dissolves other materials
9	Miscellaneous	Various	Low to moderate hazard

Hazardous Materials Release or Spill

Virtually all sectors of the City and County economies are users of hazardous materials, which may be found at all stages of production, transportation, consumption and disposal. Federal and state laws permit the intentional release of some hazardous materials, typically in quantities, in a form, and/or in locations such that the risk to human health and the environment is thought to be acceptable. However, if improperly handled, stored, transported, or disposed of, these materials can pose substantial health and safety hazards and environmental threats. Santa Ana faces a potential for incidents from stationary hazardous materials users as well as transportation accidents, pipeline ruptures, illegal dumping or intentional acts of sabotage.

Impacts on the environment, property or human health are dependent on the type, location and quantity of hazardous material released. The actual impact depends on where the episode occurs and on weather, geography, population, and other site-specific conditions that influence the behavior of the material in the environment, and these can vary greatly. Incidents may occur at fixed facilities where the opportunity for development of site-specific contingency plans is great. They may also occur at any place along road, rail or air transportation routes, and (in the case of rail or aircraft accidents or illegal dumping) may occur in unpredictable areas, relatively inaccessible by ground transportation. Hazardous material incidents often cause some type of transportation disruption within the vicinity of the incident and may require localized evacuation.

Accidental hazardous materials releases occur many times during any given day. In an average year, the California State Warning Center receives approximately 11,000 reports on hazardous material incidents and potential hazardous material incidents. Of these incidents, most are minor but some do cause significant impacts such as injuries, evacuation, and the need for extensive cleanup.

Fixed Sites - The Hazardous Material Disclosure and Business Emergency Plan programs require businesses that handle hazardous materials in quantities equal to or greater than 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of compressed gas, or extremely hazardous substances above a threshold planning quantity, to report this information to the local implementing agency called the Certified Unified Program Agency (CUPA). The purpose of the programs is to prevent or minimize damage to public health and safety and the environment, from a release or threatened release of hazardous materials. These locally implemented programs also satisfy federal community right-to-know laws.

The Orange County Health Care Agency serves as the Certified Unified Program Agency (CUPA) for this geographic region. The City of Santa Ana has approximately 1,045 facilities listed under the CUPA for hazardous materials management. Most of these facilities are low-hazard businesses such as automotive repair, construction and light manufacturing. The exact location of what materials are in what locations is not included in this Plan, as it may be proprietary information for businesses, is likely to change frequently over time, and may represent a security risk to publish.

Transportation Routes – Spills or release in transportation can result in the closure of freeways and surface streets, an extreme hazard to the public and to first responders, significant environmental damage and water supply contamination, and evacuation of large areas.

Highways and freeways are the major transportation routes in Orange County for hazardous materials from suppliers to users to disposal sites. Over 250 miles of interstate highway, including the third busiest highway transportation corridor in the country (the 5 Freeway), and 719 miles of other major transportation routes run through Orange County.

In addition to the roadway system, Orange County's major transportation routes include 117 miles of railways, with some passing through the City of Santa Ana. These routes are used daily to transport hazardous materials and transportation accidents from collisions or derailments can occur and may cause the release of hazardous materials.

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Another major hazardous materials transportation mode in Orange County and through the City is that of underground pipelines. These pipelines predominately transport crude or refined petroleum, gasoline, and jet fuel. The major threats posed by this transportation method include explosions, fire, and contamination of groundwater used as a source of drinking water.

In Orange County, the majority of hazardous material incidents are handled prior to becoming a disaster. Hazardous material incidents require specialized technical expertise that varies depending on the materials involved and the type of incident. The resources and personnel required to react to a hazardous materials incident may involve various local, special district, state, and federal agencies. First responders are usually Orange County Fire Authority and Santa Ana Police Department, followed by Orange County Health Care Agency's Environmental Health Division. Other local agencies may include Santa Ana Public Works (Street and Water Divisions), HCA Epidemiology, and a long list of state and federal agencies, primarily including environmental and transportation agencies. Private sector organizations, specifically those owning or transporting the materials, would have a role also.

Significant release of a hazardous material has the potential to result in a mass-casualty incident requiring medical treatment and/or decontamination for many exposed persons, as well as evacuations of surrounding communities. Significant fires or explosions over a wide area may also result. The repair of damaged infrastructure and the cleanup of all released material may take weeks to years and generate costs in the millions or tens of millions of dollars.

2.4.15 Urban Conflagration

Definition and Causes

Urban conflagration is a large fire occurring in an urban area that consumes multiple structures, with the potential to spread to whole neighborhoods or multiple locations. Although communities like the City of Santa Ana, without a wildland-urban interface, are much less likely to experience catastrophic fire, there are scenarios where the City might be exposed to urban conflagration. Causes of urban conflagration may include:

- Criminal acts, such as arson, acts of terrorism, or civil unrest;
- Industrial accidents, such as hazardous materials incidents, explosions, gas leaks, or transportation accidents (railroad crash, aircraft crash or trucking accident);
- Acts of nature, including structure fires intensified by high winds or hot and dry weather conditions, wildfires driven into urban areas, or ignitions following a large earthquake.

Although the risk to life and property from urban conflagration has been substantially reduced through improvements in community design, construction materials, and fire protection systems, it remains a threat. One reason is a continuing trend toward increased urban density and infill development. A post-World War 2 building boom resulted in the development of almost all developable land in the City by the 1970's. But the City's population increased by almost 140,000 people (approximately 70%) between 1980 and its peak in 2002 (near where it remains today). This growth was accommodated by near-total infill development (development of all vacant properties), an increase in multi-family or higher density housing, and renovation/expansion of existing structures. Approximately 80% of homes in the City were built in the 1970's or before, with approximately 55% built more than 50 years ago. This dense environment of structures built to older building code standards, with some maintained or renovated below building code standards, can contribute to the threat of urban conflagration.

A variety of fire protection challenges exist in the City of Santa Ana. Among these are the high density of development; high rise buildings; large industrial or manufacturing complexes; hazardous materials transportation, use or storage; rail lines; a flight path to one of the busiest airports in the United States; and natural disasters.

Urban Conflagration Scenarios

The most likely scenario for urban conflagration in Santa Ana is a major earthquake in the area. Earthquakes may cause natural gas mains to rupture or cause damage to gas-fueled appliances in homes or businesses, may cause power lines to fall or electrical appliances to malfunction, and may cause fuel spills or release of flammable substances in homes or businesses. Large fires following an earthquake in an urban area are relatively rare, but have occasionally been of catastrophic proportions. The two largest peacetime urban fires in history, 1906 San Francisco and 1923 Tokyo, were both caused by earthquakes. With Santa Ana's dense and older construction, fires resulting from such earthquakes may cause substantial damage.

The conflagration in San Francisco after the 1906 earthquake was the single largest urban fire, and the single largest earthquake loss, in U.S. history. The loss over three days of more than 28,000 buildings over an area of nearly 5 square miles was staggering: \$250 million in 1906 dollars, or about \$5 billion today.

A more recent large urban fire occurred as a result of the Loma Prieta earthquake in 1989. 41 large fires occurred in the City of San Francisco after the quake. Gas main and pipe ruptures ignited 27 fires within the City, including a major blaze in the Marina District that destroyed four buildings and claimed the lives of five people. Damaged domestic water lines intensified the crisis.

In 1991, a vegetation fire was driven into the Cities of Oakland and Berkeley by intense winds. The Oakland/East Bay Hills Fire claimed 25 lives, destroyed 2,449 single-family dwellings and 437 apartment/condo units, and caused economic losses estimated at \$1.5 billion.

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In September 2010, an explosion and large fire were reported in the City of San Bruno. Arriving emergency responders observed numerous homes destroyed or burning. The fire and destruction were so widespread that it was initially believed to be the site of an airplane crash. It was determined instead that a large (30-inch) natural gas main had ruptured and exploded. Eight residents were killed and 66 more were injured, 38 homes were destroyed and 62 more were damaged, 377 homes were evacuated, and \$55 million in private property losses and \$70 million in public property losses were incurred.

More locally, in April 1982, a fire in the City of Anaheim illustrated the capability for urban conflagration in Orange County. Shortly before dawn, 50 to 70 mph Santa Ana winds caused power lines to ignite nearby palm trees. The burning trees ignited the roof of an apartment building and the intense winds caused the fire to spread rapidly from building to building through a closely packed neighborhood of apartment buildings. Natural gas lines in several buildings erupted, contributing to the intensity of the fire. The fire swept through a four-block area near Cerritos Avenue and Euclid Street, ultimately destroying 40 apartment buildings, more than 400 apartment units, and several homes and businesses. 1,500 people were left homeless and the \$50 million in property damage made this one of the costliest fires in Orange County history, resulting in both a State Proclamation of Emergency and a Federal Disaster Declaration.

The 1989 Loma Prieta Earthquake, the 1991 Oakland Fire, the 2010 San Bruno Pipeline Explosion and the 1982 Anaheim Fire all demonstrate the possibility of fire developing into an urban conflagration. Several elements that contribute to this threat exist in the City of Santa Ana: natural or human-caused sources of large fires, density of development, wood construction and older construction, the possibility of strong Santa Ana winds, limited personnel and equipment to address multiple fires, and potential disaster impediments to firefighting capabilities, such as debris blocking access of firefighting equipment or a damaged water supply.

Chapter 3 – Concept of Operations and Emergency Organization

3.1 Emergency Management Goals, Phases and Mission Areas

Emergency management is an essential role of government. As stated in Chapter 1, the goals of emergency management are to protect life, property and the environment from the effects of natural disasters, human-caused disasters (intentional or unintentional) or failures of technological infrastructure, by:

- Preventing disasters where possible,
- Reducing the community's vulnerability to disasters that cannot be prevented,
- Establishing capabilities to protect the community from the effects of disasters,
- Responding effectively to the actual occurrence of disasters, and
- Providing continuity of government and delivery of essential services for the well-being and rapid recovery of the population.

Comprehensive Emergency Management is a concept to ensure that these goals are met through fulfillment of the four phases of Mitigation, Preparedness, Response and Recovery.

Mitigation Phase

Mitigation efforts occur both before and after emergencies or disasters and include eliminating or reducing the impact of hazards that exist within the City. Pre-disaster mitigation is the effort to strengthen the community and improve community resiliency before a disaster causes loss of life, damage to property or adverse impacts to the environment. Post-disaster mitigation incorporates strengthening and improving the community during the recovery and re-building process after a disaster occurs. These activities include enacting and enforcing building, fire and safety codes; zoning and land use management; improving or retrofitting structures and properties; and public education. The City of Santa Ana Hazard Mitigation Plan provides further detail on mitigation measures.

Preparedness Phase

The preparedness phase involves activities undertaken in advance of an emergency or disaster to develop the City's capabilities and resources for an effective response to disasters. Emergency plans are developed and updated to guide emergency response. Preparedness activities also include developing hazard analyses, training and exercising of personnel, acquiring supplies and equipment and improving public information and communications systems.

Response Phase

The response phase includes any action taken before, during or after an emergency to reduce casualties, save lives, minimize damage to property and the environment, and to enhance the effectiveness and speed of recovery. This is the phase where emergency plans are implemented and resources are deployed. These may include warnings and notifications to staff and the public, activation of the Emergency Operations Center (EOC), evacuation, rescue, medical care, emergency proclamations and similar operations addressed in this Plan.

Recovery Phase

Recovery activities involve restoration of services to the public and returning affected areas to pre-emergency conditions and functions. Recovery activities may be short-term or very long-term, ranging from restoring essential utilities such as water and power; restoring transportation, communications and other critical infrastructure; returning people to homes; re-opening schools and businesses; pursuit of reimbursement or financial assistance; or mitigation measures designed to prevent future occurrences or reduce the future impacts of a hazard.

The Federal Emergency Management Agency established a National Preparedness Goal of:

“A secure and resilient Nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.”

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The National Preparedness Goal is similar to the concept of comprehensive emergency management but broadens the focus to also include homeland security and terrorism. The goal recognizes five mission areas of Prevention, Protection, Mitigation, Response and Recovery, defined as:

- **Prevention:** The capabilities necessary to avoid, prevent, or stop a threatened or actual act of terrorism. Within the context of national preparedness, the term “prevention” refers to preventing imminent threats.
- **Protection:** The capabilities necessary to secure the homeland against acts of terrorism and manmade or natural disasters.
- **Mitigation:** The capabilities necessary to reduce loss of life and property by lessening the impact of disasters.
- **Response:** The capabilities necessary to save lives, protect property and the environment, and meet basic human needs after an incident has occurred.
- **Recovery:** The capabilities necessary to assist communities affected by an incident to recover effectively.

The National Preparedness Goal also describes 32 activities, called Core Capabilities, which identify and define the abilities and resources necessary to address the greatest risks to the nation. More information on the National Preparedness Goal and core capabilities can be located at <https://www.fema.gov/national-preparedness-goal>.

3.1.1 Sequence of Events during Disasters and Emergencies

Some emergencies may be preceded by a buildup or warning period, providing sufficient time to warn the public and implement preparedness measures designed to reduce loss of life, property damage, and effects on the environment. Other emergencies occur with little or no warning, thus requiring immediate implementation of this EOP and efficient and coordinated mobilization and deployment of resources. Event sequences may include:

Before the Event

Routine Monitoring for Alerts, Advisories, Watches and Warnings:

Emergency management and public safety officials monitor events and the environment to identify threats that may affect the City, and disseminate awareness throughout the Emergency Organization and the community when a threat is approaching or imminent.

Increased Readiness:

Sufficient warning provides an opportunity for City departments and agencies to increase readiness; actions designed to increase the City’s ability to respond effectively when the emergency occurs, which may include:

- Briefing staff and officials
- Reviewing plans and procedures
- Preparing and disseminating information to the community
- Testing systems, such as communication and warning systems
- Updating resource or contact lists
- Precautionary activation of the Emergency Operations Center

Pre-Impact

When an event is foreseen as highly likely, action is taken to save lives and protect property. During this phase, warning systems are activated, resources are mobilized and evacuations may be initiated.

Immediate Impact

During this phase, objectives are established and plans implemented to save lives, control the situation and minimize the effects of the event. Response activities are initiated and resources are deployed in the field and other City staff and agencies provide support and coordination to field responders.

Sustained Operations

As the event continues, further emergency assistance is provided to victims of the disaster and efforts are made to reduce the likelihood of cascading effects or secondary damage. This phase consists of ensuring sufficient

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resources are deployed to provide public safety and necessities of food, water, shelter, medical care and utilities to sustain the responders and the public through the emergency phase.

Transition to Recovery

As the initial and sustained operational priorities are met, City officials consider recovery phase needs. Short-term recovery activities include returning vital life-support systems to minimum operating standards. Long-term activity is designed to return the community to normal functioning. Recovery planning should include review of ways to avert or mitigate future emergencies. During the recovery phase, damage is assessed, local assistance centers and disaster recovery centers are opened and hazard mitigation surveys are performed.

3.2 ICS, SEMS and NIMS Management Systems

3.2.1 Incident Command System (ICS)

Southern California firefighting agencies developed the Incident Command System (ICS) after rapidly moving, destructive wildfires occurred in southern California in the early 1970's. ICS was designed to allow multiple agencies to coordinate their response, communicate effectively and share resources during large or complex fires, where these multiple agencies have to combine forces to manage a widespread event as a single entity. Primary ICS features include:

- **Essential Management Functions** - Five essential functions that must be performed to adequately manage any incident:
 - **Command/Management** - Establishing priorities and objectives and providing authority to act;
 - **Operations** - Carrying out the tactical response activities to fulfill the objectives;
 - **Planning/Intelligence** - Gathering, verifying and distributing information and preparing action plans;
 - **Logistics** - Acquiring the personnel, supplies, equipment and support services needed to meet the needs of the response; and
 - **Finance/Administration** - Performing purchases or contracting, maintaining cost accounting and performing cost recovery for incident expenses.
- **Management by Objectives** – Measurable and attainable objectives for a given time period;
- **Incident Action Planning** – Written or verbal plans specifying the objectives and the steps necessary to achieve them, job assignments, resources required and supporting information;
- **Common Organizational Structures and Terminology** – A common organizational structure that can be scaled in size to meet the demands of any incident, together with common job titles and other terminology, so that all responding organizations can communicate effectively.
- **Manageable Span of Control/Unity of Command** – Structuring the response organization so that supervisory levels can effectively ensure that subordinate levels are able to achieve response objectives in a safe manner, and that all response elements have only one supervisor and chain of command.

3.2.2 Standardized Emergency Management System (SEMS)

In 1991, the Oakland-East Bay Hills Fire caused similar devastation and substantial loss of life in northern California, and involved agencies identified similar problems with multi-agency communication and coordination as those identified in the development of southern California's ICS. The State of California passed legislation establishing the Standardized Emergency Management System (SEMS) and requiring its use by all jurisdictions in the state to manage multi-agency or multi-jurisdictional emergency incidents in California.

SEMS incorporates all ICS features described above, and further includes:

- **Five Levels of Response** - SEMS consists of five organizational levels that are activated as necessary to meet the needs of the incident:
 - **Field Response** - The field response level is usually the first level to become activated. This is where emergency response personnel and resources, under the command of an incident commander, implement tactical decisions and activities in the field in direct response to an incident or threat. In the City of Santa Ana, field response is primarily conducted by Santa Ana Police Department, Orange County Fire Authority or Santa Ana Public Works Agency.

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- Local Government - Local governments include cities, counties and special districts. Local governments manage and coordinate the overall emergency response and recovery activities within their jurisdiction and includes bringing additional staff and departments into the response to provide support and coordination to field responders. The local government level is where this Plan and the City of Santa Ana Emergency Operations Center (EOC) sit.
- Operational Area - The Operational Area is the intermediate level of the State's emergency organization. Operational Areas are arranged by county and consist of all political subdivisions within a county, including County government, all cities, all districts and all other public agencies authorized by law within that county. County government is responsible for appointing a lead Operational Area agency, and in Orange County, the Orange County Sheriff's Department Emergency Management Division is the lead agency. The Operational Area is responsible for:
 - Coordination of emergency activities, information, resources and priorities within the geographic area of the county,
 - Serving as a coordination link between the political subdivisions of the county and the regional level activities of the State.
- Region - California is divided into three California Office of Emergency Services Administrative Regions - Inland, Coastal and Southern - which are further divided into specific mutual aid regions. The Regional Level manages and coordinates information and resources among all Operational Areas within the region, and between each Operational Area and the State Level, and also coordinates state agency support for emergency response activities within the region. Orange County is within the Southern Region, whose Regional Emergency Operations Center (REOC) is also located in Orange County.

Figure 118 California Office of Emergency Services Administrative Regions



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- State Level - The State Level prioritizes tasks, coordinates state resources in response to requests from the Regional Level, and coordinates requests and information between Regions. The State Level also serves as the communication and coordination link between the state and federal government or with other states when federal or interstate assistance is requested.
- Mutual Aid - The foundation of California's emergency planning and response is a statewide mutual aid system designed to ensure adequate resources, facilities, and other support are provided to jurisdictions whenever their own resources prove to be inadequate to cope with a situation. The basis for the system is the California Disaster and Civil Defense Master Mutual Aid Agreement and is provided for in the California Emergency Services Act. The Master Mutual Aid Agreement creates a formal structure wherein each jurisdiction retains control of its own facilities, personnel and resources, but may also receive or render assistance to other jurisdictions within the state. State government is obligated to provide available resources to assist local jurisdictions in emergencies.
- Multi-Agency Coordination Systems (MACS) - Multi-Agency Coordination, also referred to as Inter-Agency Coordination, is the coordinated participation of all agencies and disciplines involved at any level of the SEMS organization working together to facilitate decisions for overall emergency response activities, including the prioritization among multiple incidents and the sharing of critical resources. This includes coordination between different disciplines (law enforcement, fire and rescue, public works), between different jurisdictions (multiple cities affected by an event) and between multiple levels of government (city, county, state and federal agencies).

3.2.3 National Incident Management System (NIMS)

In the aftermath of the September 11, 2001 terrorist attacks on the United States, Homeland Security Presidential Directive 5 (HSPD-5) directed the United States Department of Homeland Security to establish the National Incident Management System (NIMS). NIMS is a consistent nationwide approach for all levels of government, but also incorporates the private sector and non-governmental organizations, to work efficiently and effectively together to prepare for, respond to and recover from incidents regardless of cause, size or complexity. NIMS was developed from the basis of the ICS and SEMS systems and the policies and procedures are compatible and complimentary to each other. At the federal level of response, the National Response Framework identifies the methods and means for federal resources to provide support to state and local governments.

3.2.4 Incorporation of ICS, SEMS and NIMS into Plans and Operations

The City of Santa Ana will utilize the Incident Command System, the Standardized Emergency Management System and the National Incident Management System to manage emergency response operations, will incorporate their elements into all emergency plans and procedures, and will train all employees and emergency responders in ICS, SEMS and NIMS features and requirements.

3.3 City of Santa Ana Emergency Organization

Under the Emergency Services Division of the Santa Ana Municipal Code (Chapter 2, Article IV, Division 15), all officers and employees of the City as well as volunteers enrolled with the City, make up the Emergency Organization of the City. Under the National Incident Management System, all residents, private sector businesses, non-governmental organizations and volunteer groups in the City may also be called upon to serve in the City's Emergency Organization. This Emergency Organization represents the full scope of resources that may be activated and charged with duties for the protection of persons and property in the City during a proclaimed emergency.

The Santa Ana Municipal Code establishes the position of Director of Emergency Services (DES), which is the official having full authority over the operations and resources of the City and the authority to exercise specific emergency powers and duties during a proclaimed emergency. This position is filled by the City Manager. There is also created the position of Deputy Director of Emergency Services, filled by the Chief of Police, who serves as the City official with primary day-to-day authority over emergency plans and programs. In the unexpected absence of the City Manager, the following officials in the order named may automatically succeed to the position of Director of Emergency Services:

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1. Deputy Director of Emergency Services/Chief of Police
2. Assistant City Manager
3. Deputy City Manager
4. Director of Public Works
5. Director of Finance and Management Services
6. Director of Planning and Building

The Director of Emergency Services is responsible to City Council or to the City Manager when the City Manager designates another official to fill that role in a specific event. The Director of Emergency Services is responsible for implementing the Emergency Operations Plan and for overall management of the response effort, through:

- Organizing, staffing and operating the City Emergency Operations Center (EOC)
- Assessing/analyzing the needs of the community and implementing appropriate responses
- Directing overall operations and planning for the emergency, and providing authority to act
- Providing information and guidance to the public, including alerting and warning the public
- Maintaining information on the status of City resources, services and operations
- Collecting, evaluating and disseminating damage assessment and other essential information
- Obtaining support for the City and providing support to other jurisdictions, as required
- Providing status reports, damage estimates and other information to the Operational Area

The official acting in the capacity of the Director of Emergency Services may exercise the emergency powers and authorities as they are delineated in Section 3.8.1 below under Proclamations of a Local Emergency.

City Council works closely with the Director of Emergency Services during and following a major emergency. While the DES maintains primary authority over the City's emergency response, City Council may be called upon for policy guidance or to provide additional legal authority to act through ordinances or resolutions. City Council may serve as a conduit between government and the public as well as between the City and elected officials at county, state and federal levels or other local jurisdictions impacted by the event. City Council may also proclaim a local emergency or ratify, extend or terminate the emergency proclamation of the DES (see Section 3.8).

The remainder of the City's Emergency Organization is a collective representation of how City departments and agencies fulfill implementation of ICS/SEMS/NIMS essential functions in an emergency.

3.4 Direction, Coordination and Control

3.4.1 City of Santa Ana Direction, Coordination and Control

The City of Santa Ana is a political subdivision of the State of California and this Emergency Operations Plan is considered an extension of the State of California Emergency Plan. The City's Emergency Organization will be the first level of response in an emergency, but is supplemented by the additional organizational levels and layers of response provided by the State of California Standardized Emergency Management System and the federal National Incident Management System.

The City of Santa Ana manages emergencies with the ICS, SEMS and NIMS systems detailed above in Section 3.2. During significant emergencies, the City has primary responsibility to direct and coordinate emergency operations at the field response and local government levels. At the field level, all City departments and agencies with a field-response role will use the Incident Command System to standardize the emergency response and will manage the response under the direction and control of Incident Commander(s). The Incident Commander(s) report incident-related information to the City Emergency Management Organization in the Emergency Operations Center (EOC), whose responsibility is to provide support and coordination for Incident Commanders in the field and to manage and implement higher-level or citywide policies and objectives.

3.4.2 Operational Area, Region and State Direction, Coordination and Control

Under the authority of the California Emergency Services Act, the County of Orange leads the Orange County Operational Area, with responsibility to support all Operational Area jurisdictions in identifying and prioritizing needs and coordinating resources throughout the Operational Area and communicating with regional and state

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authorities. The Operational Area will serve as the focal point for information exchange and resource requests among all jurisdictions within the County, and is responsible for:

- Sharing information among Operational Area jurisdictions and with the California Office of Emergency Services (Cal OES) Southern Regional Emergency Operations Center (REOC).
- Serving as the mutual aid coordination point for Operational Area jurisdictions seeking resource support from within or outside the Orange County Operational Area.
- Identifying and coordinating with resources outside the mutual aid system for the benefit of Operational Area jurisdictions.
- Identifying the best strategy for sharing, acquiring, and/or distributing resources and personnel in the Operational Area, based on its overall perspective of the needs of all involved Operational Area jurisdictions.
- Coordinating regional resources to serve all Operational Area jurisdictions when a single collective approach is more efficient than individual efforts spread among jurisdictions.
- Identifying opportunities to improve the efficient use of response resources and personnel amongst Operational Area jurisdictions.

The Orange County Operational Area is within the California Office of Emergency Services Southern Administrative Region and Mutual Aid Region I (Figure 118 above). The Southern Region Emergency Management Organization has responsibility to support all southern California Operational Areas in identifying and prioritizing needs throughout the region, brokering resources among Operational Areas and communicating with other regional and state authorities. The Governor and the Cal OES Director, assisted by State agency directors and staff, constitute the State Emergency Management Organization, and will coordinate statewide operations to include the provision of mutual aid and other support to local jurisdictions and the re-direction of essential resources as required.

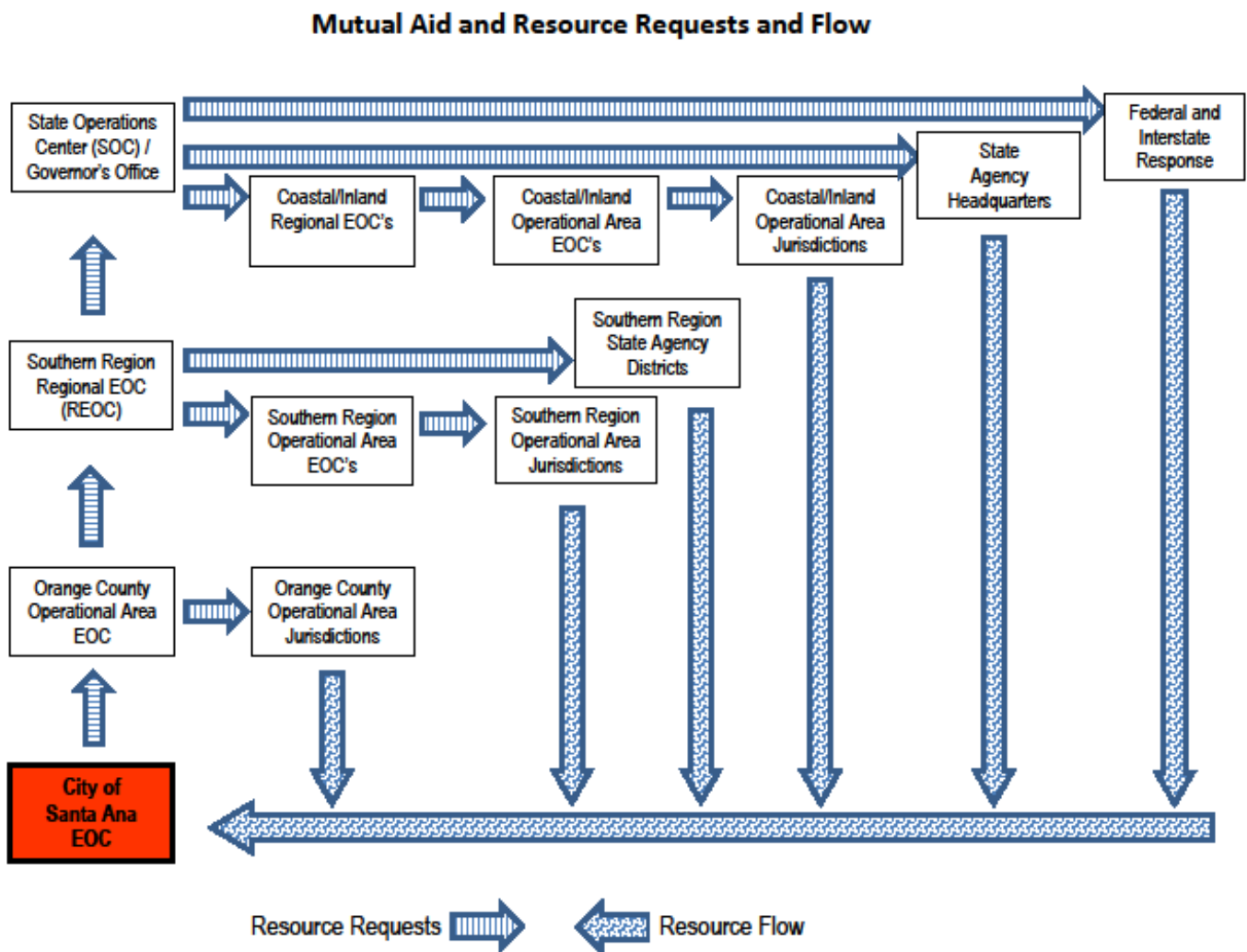
3.5 Mutual Aid and Resource Management

3.5.1 Mutual Aid and Resource Management Systems

The California Disaster and Civil Defense Master Mutual Aid Agreement, developed under the California Emergency Services Act, is the basis for the statewide mutual aid system, which is designed to ensure that adequate resources, facilities and other support are provided to jurisdictions whenever their own resources are inadequate to cope with an emergency. The Master Mutual Aid Agreement creates a formal structure wherein each jurisdiction retains control of its own facilities, personnel and resources, but may also receive or render assistance to other jurisdictions within the state.

This statewide mutual aid system, operating within the framework of the Master Mutual Aid Agreement, allows for the progressive mobilization of resources to and from emergency response agencies, local governments, operational areas, regions and state agencies with the intent to provide requesting agencies with the resources they need. The general flow of mutual aid resource requests and resources within mutual aid systems consists of continuously expanding loops until sufficient resources are acquired, as depicted in the diagram below.

Figure 122 Mutual Aid Resource Requests and Flow



Mutual aid may also be obtained from other states or from federal agencies. Interstate mutual aid may be obtained through direct state-to-state contacts, pursuant to interstate agreements and compacts, or may be coordinated through federal agencies.

The statewide mutual aid system includes several discipline-specific mutual aid systems, such as fire and rescue, law enforcement, medical, public works and emergency management. The adoption of SEMS does not alter these existing mutual aid systems; they are consistent with the local government, operational area, regional and state levels within SEMS. The State of California has established six geographic Mutual Aid Regions, divided up by counties, for these mutual aid systems. Orange County and the City of Santa Ana are in Mutual Aid Region I.

Discipline-specific mutual aid systems work through designated Mutual Aid Coordinators at the Operational Area, Regional and State levels. The role of a Mutual Aid Coordinator is to receive mutual aid requests, coordinate the provision of resources from within the coordinator's geographic area of responsibility, and pass on unfilled requests to the next geographic level. Mutual aid requests that do not fall into one of the discipline-specific mutual aid systems are handled by Emergency Management staff at each SEMS jurisdictional level.

Mutual Aid Coordinators generally function from the appropriate jurisdictional-level EOC when that EOC is activated, to facilitate coordination and information flow. Some incidents require mutual aid but may not require activation of EOCs, because of the incident's limited impacts. In such cases, Mutual Aid Coordinators typically handle requests from their normal work location. When EOCs are activated, all activated discipline-specific

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mutual aid systems will establish coordination and communications with the EOCs regardless of their work location.

3.5.2 Activation of Mutual Aid

Mutual aid assistance may be provided under one or more of the following authorities:

- California Master Mutual Aid Agreement
- California Fire and Rescue Emergency Mutual Aid Plan
- California Law Enforcement Mutual Aid Plan
- California Coroners' Mutual Aid Plan
- California Emergency Management Mutual Aid (EMMA) Plan
- California Medical Mutual Aid Plan
- Statewide Public Works Mutual Aid Agreement
- Emergency Management Assistance Compact (EMAC)
- Transit Mutual Assistance Compact (TransMac)
- Orange County Operational Area Agreement
- Water Emergency Response Organization of Orange County (WEROC)
- California Water/Wastewater Agency Response Network (Cal WARN)
- Robert T. Stafford Disaster Relief and Emergency Assistance Act

When there are not enough resources within the City of Santa Ana to respond effectively to an emergency, the affected City Department(s) will be responsible for identifying and defining the assistance needed and drafting the resource request to secure those resources through the Operational Area or Mutual Aid Coordinator. These resource requests will be routed through the City EOC, when activated, or directly to Operational Area Mutual Aid Coordinators.

Resource requests should specify, at a minimum:

- Number and type (discipline or skill) of personnel needed.
- Type, amount and performance specifications of equipment needed.
- Reporting time, location and access routes.
- Authority to whom resources should report and contact information.
- Estimated duration of operations.
- Anticipated risks or hazards.

When requests cannot be fulfilled from resources currently available within the Orange County Operational Area, the Operational Area Mutual Aid Coordinator(s) will provide relevant information and submit requests for support to the Cal OES Regional EOC to be filled from regional or statewide mutual aid resources.

3.5.3 Discipline-Specific Mutual Aid Systems

3.5.3.1 Law Enforcement and Coroner Mutual Aid

Any Santa Ana Police Department official designated to act as an Incident Commander, or any member of Santa Ana Police Department Command Staff (any Watch Commander, Bureau or Division Commander, Deputy Chief or Chief of Police) may initiate a request for law enforcement mutual aid.

The Orange County Sheriff-Coroner Department serves as the Law Enforcement and Coroner Mutual Aid Coordinator for the Orange County Operational Area. The Sheriff's Department maintains a Law Enforcement Mutual Aid Bureau, which is responsible for organizing and coordinating with all law enforcement agencies within the OA for resources to support law enforcement or coroner operations throughout the OA. If the OA Law Enforcement and Coroner Mutual Aid Coordinator is unable to gather sufficient resources from within the OA, they will make a request for additional resources to the Cal OES Southern Regional Law Enforcement and Coroner Mutual Aid Coordinator.

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The Law Enforcement Mutual Aid system is further boosted by Section 830.1 of the Penal Code, which states that whenever a State of Emergency exists within a region or area, the following personnel within the region or area, or who may be assigned to duty therein, have full peace officer powers and duties:

- All members of the California Highway Patrol.
- All deputies of the Department of Fish and Game who have been appointed to enforce the provisions of the Fish and Game Code.
- The State Forester and the staff of the Department of Forestry who are designated by the State Forester as having the powers of peace officers.
- Peace officers who are state employees within the provisions of Penal Code Section 830.5.

3.5.3.2 Fire and Rescue Mutual Aid

Fire, rescue and emergency medical services within the City of Santa Ana are provided by Division 6 of the Orange County Fire Authority (OCFA). Any OCFA Chief Officer may initiate a request for fire or rescue mutual aid assistance. OCFA also serves as the Fire and Rescue Mutual Aid Coordinator for the Orange County Operational Area, through the OCFA Duty Chief. The Fire and Rescue Mutual Aid Coordinator is responsible for organizing and coordinating with all fire and rescue agencies within the OA for resources to support fire, rescue or emergency medical operations throughout the OA. If the OA Fire and Rescue Mutual Aid Coordinator is unable to mobilize sufficient resources from within the Operational Area, they will make a request for additional resources to the Cal OES Southern Regional Fire and Rescue Coordinator.

3.5.3.3 Public Works Mutual Aid and Water and Wastewater Mutual Aid

The City of Santa Ana Public Works Agency manages public works infrastructure for the City, which includes infrastructure for roadways and vehicle travel, storm drainage and flood control, drinking water and wastewater, and removal of trash, waste and debris. Orange County Public Works coordinates the Public Works Mutual Aid System for the Operational Area and serves as the Operational Area Public Works Mutual Aid Coordinator, responsible for organizing and coordinating with other public works departments and agencies in the OA for resources to support public works needs throughout the OA. If the OA Public Works Mutual Aid Coordinator is unable to mobilize sufficient resources from within the OA, they will make a request for additional resources to the Cal OES Southern Regional Public Works Mutual Aid Coordinator.

The Orange County Public Works Mutual Aid Coordinator also coordinates with the Water Emergency Response Organization of Orange County (WEROC). WEROC is a mutual aid agreement among water and wastewater utilities within Orange County. The WEROC Mutual Aid Coordinator (OA WEROC Liaison) is responsible for organizing and coordinating with water utilities in the OA for resources to support emergency response. The Public Works Mutual Aid Coordinator and WEROC Liaison coordinate closely when both are activated. If they are unable to mobilize sufficient water resources from within the Operational Area, they will make a request for additional resources to the Cal OES Southern Region Public Works Mutual Aid Coordinator and the CalWARN (California Water and Wastewater Agency Response Network) Region 1 Representative.

3.5.3.4 Medical Mutual Aid

The City of Santa Ana does not provide medical or public health services, these are provided throughout Orange County by the Orange County Health Care Agency (OCHCA). OCHCA also serves as the Medical and Health Operational Area Coordinator (MHOAC) and coordinates the Medical Mutual Aid System for the Operational Area. The MHOAC is responsible for organizing and coordinating with other health and medical resources and agencies within the OA for resources to support the OA. If the MHOAC is unable to obtain sufficient resources within the OA, they will make a request for additional resources to the Cal OES Southern Regional Medical and Health Coordinator.

3.5.3.5 California Emergency Management Mutual Aid (EMMA)

The purpose of Emergency Management Mutual Aid (EMMA) is to provide emergency management personnel and technical specialists from unaffected areas to support local jurisdictions, Operational Area and regional emergency management or EOC operations impacted by a disaster. EMMA is a system that includes organization, information and forms to coordinate the request, reception, assignment, training and demobilization of assigned emergency management personnel. The Orange County Sheriff's Department Emergency Management Division is the EMMA Coordinator for Orange County agencies and jurisdictions.

California is a member of the interstate Emergency Management Assistance Compact (EMAC), a congressionally ratified organization that provides form, structure and procedures for rendering emergency assistance between states. After a State of Emergency Proclamation, California can request and receive assistance through EMAC from other member states. The Director of Cal OES and the State's EMAC Coordinator are responsible for facilitating requests for assistance under EMAC.

3.5.3.6 Participation of Volunteer and Private Agencies

Volunteer agencies and private agencies may participate in the mutual aid system along with governmental agencies. For example, the disaster medical mutual aid system relies heavily on private sector involvement for medical and health resources. Some volunteer agencies such as the American Red Cross, Salvation Army, and others are an essential element of emergency response to meet the needs of disaster victims. Volunteer agencies mobilize volunteers and other resources through their own systems. They also may identify resource needs that are not met within their own systems and may request assistance through the mutual aid system.

Some private agencies have established mutual aid arrangements to assist other private agencies within their functional area. For example, electric and gas utilities have mutual aid agreements within their industry and have established procedures for coordinating with governmental EOCs. In some functional areas, services are provided by a mix of special district, municipal, and private agencies and may have mutual aid arrangements that include both governmental and private agencies. Where there is a need for extensive coordination and information exchange, volunteer agencies and private agencies with substantial involvement in emergency response should be represented in EOCs at the appropriate SEMS level. Because most of these agencies span multiple jurisdictions and have limited staff members to serve in EOC's, it is most likely that they would be represented in, or coordinated through, the Orange County Operational Area EOC and the City of Santa Ana would liaison with them through that EOC.

Collaborating Organizations Active in Disaster-Orange County (COAD-OC)

COAD-OC is an organization in Orange County that focuses on coordinating private sector, nonprofit and community-based organizations with government agencies to support the volunteer and material resources of these organizations. COAD-OC is the official Voluntary Organizations Active in Disaster (VOAD) for Orange County and is a member of Southern California VOAD, a State Chapter of National VOAD. National VOAD is a forum where organizations share knowledge and resources throughout the disaster cycle of preparedness, response and recovery to help disaster survivors and their communities. In addition to being part of a national standard, following a disaster, COAD-OC can request resources or other support from Southern California VOAD when requested and in coordination with the Orange County Operational Area EOC. The Operational Area EOC serves as the point of contact for these volunteer organizations in Orange County.

3.6 Alert and Warning and Notification Systems

Alerting and warning is the process by which governmental entities (including the City of Santa Ana) and the public are made aware of the threat of imminent danger. Depending on the nature or source of the threat and the population at risk, the warning may originate from federal, state, county or local government sources or from private or non-governmental sources, and may be distributed to governmental recipients or to both government and the public at the same time.

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Success in saving lives and property is dependent on timely dissemination of warning and emergency information to the population(s) threatened. The City of Santa Ana is responsible for alerting and warning the residents and businesses in the City. The Santa Ana Police Department Communications Division and Watch Commander serve as the City's primary, 24-hour warning and notification points to receive information and notify or activate the appropriate City departments and staff. The Emergency Management/Homeland Security Division and Emergency Operations Coordinator act as additional warning points.

Notification refers to the processes by which the City will distribute warnings or emergency information to City staff and agencies and to the public. Notification also includes the processes of activating City staff into a response role and directing the public to take protective actions.

3.6.1 Alerts and Warnings Received by the City of Santa Ana

National Warning System - NAWAS

NAWAS is a 24-hour continuous private line telephone system used to convey warnings to federal agencies and state and local governments. Originally, the primary mission of NAWAS was to warn of an imminent enemy attack or missile launch upon the United States. NAWAS still supports this mission but now also includes warning of terrorist actions, natural (including weather related) and technological disasters. NAWAS allows issuance of warning to all stations nationwide or to selected stations as dictated by the situation.

The system may be activated from two federal facilities that are staffed 24 hours daily: the FEMA Warning Center and the FEMA Alternate Warning Center. Each state has a designated warning point to receive messages and further distribute them within the state. The California State Warning Center and CALWAS (see below) serve as the NAWAS warning point for California and will distribute any NAWAS warnings to each County.

California State Warning Center (CSWC)

The California State Warning Center is the official state level point of contact for emergency notifications. The CSWC maintains contact with the NAWAS National Warning Center, state and federal agencies and Operational Area Warning Points. The CSWC may be operated from two state facilities operated 24 hours daily: the primary CSWC at California OES State Headquarters, backed up by the California Highway Patrol Headquarters, both in Sacramento.

Notifications received by CSWC:

- Local governments and Operational Areas notify CSWC of emergencies affecting their community in accordance with existing laws or when state assistance may be requested.
- Earthquake Notifications: CSWC receives notifications of earthquakes from the California Integrated Seismic Network (CISN), National Earthquake Information Center (NEIC) and the United States Geological Survey (USGS).
- Tsunami Notifications: CSWC receives tsunami notifications from the National Tsunami Warning Center via the National Weather Service (NWS) and the National Warning Center.
- Weather Notifications: CSWC receives notification of forecast or existing severe weather conditions from the NWS Forecast Offices.
- Energy Notifications: The California Independent Systems Operator (California ISO) monitors the state's power grids. When the grid is unable to meet electrical demands, the California ISO will direct utilities to reduce their load and issue emergency notices of energy interruptions. CSWC will be notified when the operating reserves reach these critical levels.
- Hazardous Materials/Oil Spill Release Notifications: In accordance with state law, CSWC will be notified of any release or threatened release of hazardous materials.

CSWC Dissemination of Alert and Warnings: CSWC is responsible for informing, alerting and notifying local governments, Operational Areas, state officials and the federal government of emergencies occurring in the state. CSWC is equipped with a number of telephone, data and radio systems to distribute information, primarily including CALWAS and CLETS:

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- CALWAS: CSWC maintains the California Warning System (CALWAS), part of the National Warning System (NAWAS) private line telephone system. CSWC would utilize CALWAS to communicate emergency information or warnings to Cal OES Regional Offices and County Warning Points during an emergency. The Orange County Sheriff's Department Control One Desk receives NAWAS/CALWAS alerts for Orange County and would in turn distribute these to Santa Ana Police Department Communications and Emergency Management/Homeland Security Divisions.
- CLETS: The California Law Enforcement Telecommunications System (CLETS) is a high-speed message switching system that provides law enforcement agencies with the capability of providing rapid, point-to-point delivery of messages between agencies. The CSWC, CHP Headquarters or other law enforcement agency headquarters would utilize this system to transmit emergency information to Santa Ana Police Department Communications Division.

National Weather Service (NWS)

National Weather Service (NWS) Forecast Offices throughout the state issue several types of products to warn of extreme or hazardous weather conditions. NWS-San Diego Office prepares notifications for Orange County, with the City of Santa Ana specifically located in the Orange County Inland zone. NWS-San Diego would transmit notifications to the CSWC, Orange County Operational Area and City of Santa Ana, as well as to public news and media outlets. NWS products affecting the City of Santa Ana may include those for Excessive Heat, Frost or Freeze (Extreme Cold), High Winds, Fire Weather/Red Flag Conditions, Severe Thunderstorm/Tornado, Floods and Dense Fog. NWS issues these products:

- Statements - A broad discussion of weather expected across an area, generally for forecast periods beyond 48 hours. These usually do not represent a currently hazardous condition. May also be issued to update to one of the other listed products.
- Advisory - Special weather conditions that are less serious but may cause significant inconvenience, and if caution is not exercised, could lead to situations that may threaten life or property. Advisories are issued 12 to 48 hours in advance.
- Watch - A Watch is used when the risk of hazardous weather has increased significantly, but its occurrence, location, and/or timing is still uncertain. A Watch is advance notice that a Warning may occur in the next 36 to 48 hours.
- Warning - A Warning is issued when a hazardous weather event is occurring, is imminent, or has a very high probability of occurring. A warning is used for conditions that do pose a threat to life or property. A Warning may be issued 12 to 48 hours in advance, if possible.

National Terrorism Advisory System (NTAS)

The National Terrorism Advisory System (NTAS) provides information on terrorism and homeland security issues and threats. It is prepared by the US Department of Homeland Security and distributed to all federal, state and local governments as well as all public news and media outlets. Advisories may include specific information, if available, about the nature of a threat or the location, mode of transportation or critical infrastructure potentially affected by the threat, and steps that individuals and communities can take to protect themselves or help prevent, mitigate or respond to the event.

Types of NTAS Advisories:

- Bulletin - Describes current developments or general trends regarding threats of terrorism.
- Elevated Alert - Warns of a credible terrorism threat against the United States, but may not include specific information about timing or location.
- Imminent Alert - Warns of a credible, specific and impending terrorism threat against the United States.

Emergency Alert System (EAS)

The Emergency Alert System (EAS) is designed for television, cable television and AM and FM radio broadcast systems to disseminate emergency public information to the public. This system enables the federal, state and local governments to communicate with the public. EAS is operated, on a voluntary basis, by the facilities and personnel of the broadcast industries according to established EAS plans, standard operating procedures and Federal Communications Commission (FCC) rules and regulations.

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EAS can be accessed at federal, state and local levels to transmit essential information to the public. Examples of emergencies that may warrant EAS activation include acts of war or terrorism, national security emergencies, earthquakes, heavy rains and flooding, 9-1-1 system outages, severe industrial accidents, and hazardous material accidents. Message priorities under FCC rules are as follows:

Priority One:	Presidential Messages (carried live)
Priority Two:	Operational (Local) Area Programming
Priority Three:	State Programming
Priority Four:	National Programming and News

Presidential messages and national programming will be routed over established network facilities of the broadcast industry to the public. State programming originates from the State Operations Center and is transmitted to law enforcement agencies throughout the state using the state's California Law Enforcement Radio System (CLERS). Operational Area programming messages are transmitted by Local Primary (LP-1) and (LP-2) stations to the public. Orange County relies on KWVE-107.9 FM (located in the City of Santa Ana) as its LP-1 EAS station and the LP-2 (back-up) broadcast facility is operated through the Orange County Sheriff's Department Control One Desk at Loma Ridge. These messages will be picked up and re-broadcast by other local broadcast networks.

Because EAS messages are transmitted over television and radio broadcast networks, they will be widely distributed and cannot be geographically targeted to a narrow audience. Therefore, EAS broadcasts are limited to content that is of concern to a widespread segment of the County or regional population. For the Orange County Operational Area, EAS activation can be authorized by any one of the following parties for the County:

- Orange County Sheriff-Coroner Department, Department Commander
- Orange County Fire Authority Chief, Division Chief, Battalion Chief
- Orange County Health Care Agency Health Officer
- OC Public Works Director
- County of Orange Director of Emergency Services

Public Media and Public Reports

Like all individuals, City staff have access to and monitor media and news outlets on a continual basis. If the media reports an incident occurring or threats of developing incidents, the City may become aware of these reports just as any member of the public would. Additionally, for events that emerge locally or develop gradually, the City may become aware of these through resident's reports to 911 or to Police, Fire or Public Works Departments dispatch lines or City Hall phones.

Additional Distribution Lists

Emergency Management and Police Department personnel also individually receive notifications from telephone, text or email-based distribution lists for specific hazards or events, including:

- US Geological Survey Earthquake Notification Service (USGS ENS) – Notification of date, time, location and magnitude details of earthquakes.
- California (Department of Public Health) Health Alert Network (CAHAN) – Notification of unusual or expanding illnesses or disease outbreaks.
- California Independent System Operator (Cal ISO) Alerts – Notification of forecast or actual shortfalls in electrical power supply, power supply emergencies or electrical outages, statewide.
- Southern California Edison Outage Notices/Emergency Contacts – Notification of Planned (Maintenance) or Unplanned (Repair) outages or electrical supply emergencies in the City.
- Orange County Intelligence Assessment Center (OCIAC) Alerts – Notification of intelligence reports of specific criminal, terrorist or human-caused threats affecting the City or County.
- BioWatch Actionable Result Alerts – Notification of the airborne detection of specific weaponized or naturally occurring biological agents capable of causing severe illness.

3.6.2 Notifications Provided by the City of Santa Ana

For hazard events affecting the City of Santa Ana, the City has the primary responsibility to provide emergency information, warnings, and direction on protective actions to its residents and businesses. Methods and systems for notifying the public are described below.

All emergency notifications issued by the City will be coordinated to the greatest extent possible with other responding agencies, the Orange County Operational Area and other impacted jurisdictions in accordance with current plans and procedures. Specific agencies with dual or overlapping jurisdiction within the City of Santa Ana with whom notifications should be coordinated include:

- Orange County Fire Authority
- Orange County Operational Area/OCSD Emergency Management (liaison with all County agencies and all other political subdivisions)
- Santa Ana Unified School District
- Garden Grove Unified School District (portion of the City west of Santa Ana Riverbed); Orange and Tustin Unified School Districts (small sections in the northeast portion of the City)
- Rancho Santiago Community College District/Santa Ana College and properties
- Any bordering City (Orange, Tustin, Irvine, Costa Mesa, Fountain Valley, Westminster, or Garden Grove) whose residents, businesses or departments may receive or be impacted by notifications.

AlertOC

AlertOC is the City and County emergency mass notification system and is the City's primary method of rapidly providing emergency information and warnings to large portions of the City. AlertOC utilizes the E911 database of all landline telephone numbers, and residents and businesses are also strongly encouraged to self-register, at www.AlertOC.com, to receive notifications by multiple cell, text, email, mobile app or assisted-hearing devices. These multiple methods of contact provide a redundancy to ensure that emergency messages are received as quickly as possible and to increase the success of notifications when some communication pathways may be disrupted, inoperable or overwhelmed during an emergency.

AlertOC notifications can be sent to the entire City, to selected geographic portions of the City, or to pre-programmed distribution lists. Notifications can be sent by the City, through the Santa Ana Police Department Emergency Management/Homeland Security Division and/or Public Information Office. AlertOC may also be utilized by the County of Orange, through the Orange County Sheriff's Department Control One Desk and/or Emergency Management Division, to send messages countywide or to multiple impacted jurisdictions, or to send messages on the City's behalf if the City is incapacitated.

Emergency Alert System (EAS)

The City of Santa Ana may request broadcast of an EAS message (see Section 3.6.1 above) on its behalf, if the message is applicable to a wide geographic audience. (EAS messages cannot be limited to within City boundaries.) City officials authorized to request EAS broadcast on behalf of the City include the City Manager, Chief of Police, Watch Commander, OCFA Chief Officer, or other City Official acting in one of these capacities. The City's request for EAS broadcast will be directed to the Orange County Sheriff's Department, including the OCSD Department Commander, Control One or Emergency Management Division.

Wireless Emergency Alerts (WEA)

Wireless Emergency Alerts (WEA) are text messages that can be sent through wireless carriers' networks to WEA-enabled cell phones within the impact area of an imminent and dangerous local situation, severe weather event or Amber Alert emergency. WEA messages are transmitted to all devices within range of selected cell towers or cell sites and, like EAS, cannot be limited to City boundaries. The City of Santa Ana may request broadcast of a WEA message on its behalf, if the message is applicable to a wide geographic audience. City officials authorized to request WEA broadcast on behalf of the City include the City Manager, Chief of Police, Watch Commander, OCFA Chief Officer, or other City Official acting in one of these capacities. The City's request for WEA broadcast can be directed to the Orange County Sheriff's Department, including the OCSD Department Commander, Control One Desk or Emergency Management Division.

Route Alerting or Door-to-Door Canvassing

Route Alerting is a form of notification used frequently in emergencies limited to a small area or during rapidly changing situations. In route alerting, emergency officials or affiliated volunteers drive or walk through an affected or potentially impacted area alerting residents of the emergency and actions they need to take. Route Alerting can be conducted door to door or via a public address system on a police car, fire engine, helicopter or other vehicle. Although route alerting is effective when other systems are unavailable, it is dependent on resource availability and can be a slow process. Route Alerting is traditionally utilized only in areas that are ordered to take protective action.

News Media and Social Media

The City may utilize local television and radio broadcast media, including the City's local cable TV channel, to make emergency notifications. City, Police Department and Orange County Fire Authority social media platforms and internet websites would also be utilized to publicize emergency information.

Response Personnel Notifications

City staff, officials and affiliated volunteers may be provided information or activated to respond in a number of ways. During working hours this can be via normal channels, including phone calls, email or dispatch radios. After hours, personnel can be notified through individual telephone call-outs or the AlertOC system. Critical departments (including Police, Public Works, Planning and Building, and Parks and Recreation) have their own callback systems for response personnel.

3.7 Public Information and Joint Information Systems

3.7.1 Public Information

Public information during an emergency is critical. If residents, businesses and employees lack relevant and reliable information, they may be unable to care for themselves and may feel distrust or anger at City and government authorities. The goals of emergency public information are to keep the public informed of the general progress of events and where and how they can access needed resources and information. The public also must be informed of what they can expect from the City or other responding agencies and what is expected of them to be self-reliant or to assist and advance their own safety and recovery from the event. Public information must be provided in a timely and regularly updated manner, through multiple information outlets and mechanisms, in languages and formats that meet the needs of the whole community. This includes those with limited or no English-language proficiency and persons with vision, hearing or cognitive disabilities.

Emergency public information will be disseminated using all available media and technology methods, including television and radio broadcast media, print media, phone and email notifications, websites and social media, direct outreach, and community organizations and networks. The City, individually and in cooperation with the Orange County Operational Area, has a multitude of tools available to assist in the dissemination of public information and it is the responsibility of Public Information Officer(s) to initiate the use of all applicable communication platforms to reach the required audience during response and recovery efforts. The tools listed below are intended to complement each other in distributing emergency public information and the information must be coordinated simultaneously across all possible channels to minimize conflicts or confusion.

Media Outlets

A list of media outlets for Orange County and the surrounding region is maintained by the Santa Ana Police Department Public Information Officer (PIO) and also available through the Orange County Sheriff's Department, Emergency Management Division. PIOs should attempt to contact as many media outlets as possible when disseminating information, including non-English speaking outlets, to ensure the greatest number of affected people is informed. Additionally, media outlets should be requested to provide a television crawl and sign language interpreters during press conferences, as well as media releases, so people with disabilities or those with access and functional needs have every opportunity to receive the message being broadcast.

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Web Site Pages

The City web site is an informational site for the public. The site describes the role of Emergency Management in the City, and lists and explains the various resources and organizations available to assist the public in emergencies. During an emergency, the site can serve as a place for press releases and other emergency information to be publicly posted online. The Orange County Operational Area, Orange County Fire Authority, Santa Ana Unified School District and other responding agency websites may also be utilized to further distribute and coordinate emergency information.

AlertOC

AlertOC (See Section 3.6.2 above) is the City's and Orange County's emergency public mass notification system designed to keep those who live or work in Orange County informed of important information during emergency events. AlertOC may be used to contact residents by one or all of the following methods: home phone, work phone, cell phone, e-mail, text message, including teletypewriter (TTY) capabilities, and mobile app. AlertOC may be used to provide updates to affected populations concerning emergency events.

2-1-1 Orange County

2-1-1 Orange County (2-1-1) is a telephone-based service set aside by the FCC for the public's use in accessing community services 24 hours-a-day, seven days-a-week. This need becomes even greater following a disaster. 2-1-1 works closely with the Operational Area to provide essential information to residents in the event of a local or State emergency, as well as maintaining close working relationships with Orange County Red Cross, Orange County Social Services Agency, and the Orange County Health Care Agency. 2-1-1 is kept informed with the most up-to-date information from OA or City authorities during an emergency in order to ensure they can relay and support accurate information to any calls received. 2-1-1 will also forward calls back to the County or City if there are specific requests beyond the scope of services, such as people with disabilities or access and functional needs requests, volunteer and donation offers, and others.

County and Operational Area Public Information Hotline and Rumor Control

The Orange County Sheriff's Department, Emergency Management Division maintains during OA EOC activations a Public Information Hotline and Rumor Control, which can provide current, accurate and approved information to the community. The City of Santa Ana may utilize this resource but would be requested to provide personnel and updated, City-specific information resources to assist in the effort.

Non-Governmental, Non-Profit, and Voluntary Organizations

Non-government, non-profit and voluntary organizations have a significant role in public information within the City and Operational Area. Organizations will be looking for up to date information and citizens will be turning to their familiar community organizations as a source of information. Accurate, timely and approved information that is developed by PIOs will need to be disseminated to local organizations as well as residents. PIOs will work with all information personnel, including organization liaisons, to ensure the communication of the most accurate and up-to-date information.

Translation Services

The Operational Area EOC hotline will use translation language services in addition to using multi-lingual staff members. The EOC hotline implements translation services through a language line, which is also available to the Santa Ana Police Department Communications Division. Foreign language media outlets covering Orange County are predominately Spanish and Vietnamese outlets. Effort will be made to disseminate press releases and other information in Spanish or Vietnamese to these media outlets. Hazard-specific press release templates may also be made available from the Operational Area EOC during activations in Spanish and Vietnamese to reduce the time it takes to translate documents. Whenever possible, a native language user from the intended audience will review the message for accuracy and cultural competency.

News Conferences, Public Forums and Community Meetings

News conferences are an integral part of the public information function before (when possible), during, and after an emergency. A well-crafted news conference needs to identify important facts to share with the public, such as public resources (e.g., AlertOC, ReadyOC, 2-1-1, or other services), the importance of emergency protective

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actions being taken or advised by public safety responders, and what to expect in the immediate future. For public meetings, consideration must be given to ensure resources are available to accommodate the audience being addressed, such as sign-language interpreters, large-print handouts and displays, non-English translation services, and media using in-frame captioning at all press conferences held by public officials.

There may be multiple spokespersons participating during a news conference, public forum, or community meeting. For example, law enforcement may be the spokesperson regarding evacuation incidents, and public works may be the spokesperson about debris removal or transportation issues. There may be times when one spokesperson for all aspects of the incident may be enough, but in most cases of a complex incident, a unified approach with multiple spokespersons is optimal.

Elected officials are looked to by the public as a source of information and authority during an emergency. The officials need to advise the public on the status of the incident, the resources available to them, and what the public needs to do to ensure their safety. City staff will work to give these officials the critical information needed to guide the public.

Social Media

Social media is also a powerful tool in information dissemination. The City will utilize Facebook and Twitter for communications to the public during a disaster. Integrating information being received from responders and other jurisdictions and agencies also can help to increase situational awareness and gain a better common operating picture. PIO's will monitor these accounts for relevant information; however social media accounts will be used for pushing information out and are not intended to receive any communications or requests for emergency assistance from the community.

3.7.2 Joint Information Systems (JIS)

A widespread emergency will impact multiple jurisdictions and involve multiple response agencies, each of whom will have their own PIO disseminating information and instructions to the public. This requires a coordinated public information and messaging process, which is vital to an effective emergency response. A Joint Information System (JIS) provides the mechanism to organize, integrate, and coordinate information and messages to ensure timely, accurate, accessible, and consistent messaging across multiple jurisdictions and disciplines and with nongovernmental organizations and the private sector.

A JIS includes plans, protocols, procedures, and structures used to provide public information and should include all Public Information Officers activated for an event. During an emergency involving multiple Operational Area jurisdictions, the Orange County Operational Area EOC will facilitate among jurisdictions to gather, verify, coordinate and disseminate information through a JIS and City of Santa Ana PIO's will collaborate in this process. Jurisdiction's PIO's may collocate to work together from one location, referred to as a Joint Information Center (JIC), or may work from their own multiple locations in a collaborative effort, referred to as a Virtual JIC.

3.8 Emergency Proclamations

Emergency proclamations expand the powers and authorities of the state and political subdivisions during emergency conditions and also provide a mechanism for unaffected jurisdictions to provide resources and assistance to affected jurisdictions. Although emergency proclamations facilitate the flow of resources and support to the affected jurisdictions and local government, they are not a prerequisite for rendering mutual aid and assistance under existing agreements.

The California Emergency Services Act provides for three types of emergency proclamations:

- Local Emergency
- State of Emergency
- State of War Emergency

Additionally, the Governor may request a Federal Declaration of Disaster or Major Emergency.

3.8.1 Proclamation of Local Emergency

A Local Emergency is defined in the California Emergency Services Act (CESA) as:

“The duly proclaimed existence of conditions of disaster or of extreme peril to the safety of persons and property within the territorial limits of a county, city and county, or city, caused by such conditions as air pollution, fire, flood, storm, epidemic, riot, drought, sudden and severe energy shortage, plant or animal infestation or disease, the Governor’s warning of an earthquake or volcanic prediction, or an earthquake, or other conditions, other than conditions resulting from a labor controversy, which are or are likely to be beyond the control of the services, personnel, equipment, and facilities of that political subdivision and require the combined forces of other political subdivisions to combat.”

Under the CESA, a Proclamation of Local Emergency provides the jurisdiction with the authority to:

- Promulgate or suspend orders and regulations necessary to provide for the protection of life and property (e.g., curfews or closures, emergency spending or contracting authority, suspension or waiver of procedures or policies).
- Exercise full power to provide mutual aid to any affected area, in accordance with local ordinances, resolutions, emergency plans, or agreements.
- Request state agencies and other jurisdictions provide mutual aid and if necessary, request that the Governor proclaim a State of Emergency.
- Require the emergency services of any local official, employee or person and requisition necessary personnel and materials from any local department or agency.
- Obtain vital supplies and equipment and, if required, commandeer the same for public use.
- Impose penalties for violation of lawful orders.
- Conduct emergency operations without incurring legal liability for performance or failure of performance. (Article 17 of the CESA provides for certain privileges and immunities.)

Who May Proclaim a Local Emergency

The local governing body, or an official authorized by ordinance of the local governing body, may proclaim a Local Emergency if there is, or is likely to be, extreme peril to persons or property within the territorial limits of the political subdivision, and the political subdivision is, or is likely to be, overwhelmed and unable to abate the emergency and will require resources from other political subdivisions and jurisdictions.

Pursuant to the Santa Ana Municipal Code, a Local Emergency can be proclaimed for the City by the Santa Ana City Council or these City officials designated to act as Director of Emergency Services:

- City Manager
- Chief of Police
- Assistant City Manager
- Deputy City Manager
- Director of Public Works
- Director of Finance and Management
- Director of Planning and Building

Additionally, the County of Orange may proclaim a Local Emergency on behalf of the entire County.

Time Limits for Local Emergencies

A Local Emergency must be proclaimed within 10 days of the occurrence of the emergency. If proclaimed by a designated City official, it must be ratified by the Santa Ana City Council within 7 days of the official’s original proclamation. A Proclamation of Local Emergency must be renewed by the City Council at least every 60 days until the conditions of emergency are resolved, and must be terminated by City Council at the earliest possible date that conditions warrant.

The City must notify the Orange County Operational Area and provide a copy of the Proclamation of Local Emergency as soon as possible after the proclamation. If the City is requesting a Governor’s State of Emergency

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Proclamation, Cal OES Directors Concurrence and/or CDAA funding (see below), the City will need to provide information describing local response efforts and identify the specific type and extent of state emergency assistance needed, including specific resources needed, cost reimbursement requested, or regulatory waivers necessary to facilitate the protection of life and property during response efforts.

Request for Cal OES Director's Concurrence

Following the Proclamation of a Local Emergency, the City or County can request cost reimbursement from the State under the California Disaster Assistance Act (CDAA) for certain disaster-related expenditures, through a Request for Cal OES Director's Concurrence. Cal OES must receive the request from local government within 10 days after the actual occurrence of a disaster and include the Initial Damage Estimate (IDE) and a request from the City or County. The Operational Area will generally take a lead role in gathering and submitting this documentation to the State.

Request for the Governor to Proclaim a State of Emergency

Following the Proclamation of a Local Emergency and when emergency conditions exceed or have the potential to exceed local resources and capabilities, the City or County can request cost reimbursement and response resources from the State under the California Disaster Assistance Act (CDAA) through a Request for Proclamation of a State of Emergency. Cal OES must receive the request from local government within 10 days after the actual occurrence of a disaster and include the Initial Damage Estimate (IDE) and a request from the City or County. The Operational Area will generally take a lead role in gathering and submitting this documentation to the State.

Initial Damage Estimate

The Initial Damage Estimate (IDE) is written documentation describing in approximate numbers the estimated level of casualties, property damages and dollar losses. The request for State assistance should include a copy of the local proclamation(s) and IDE(s) to document the severity and extent of the damage caused by the emergency. An IDE may not be required for sudden emergencies with widespread impacts, emergencies of significant magnitude, or during fast moving emergencies where immediate response assistance is necessary and obvious.

Analysis of Request

The request and the IDE are reviewed by the Cal OES Region and a recommendation is made to the Governor through the Cal OES Director.

3.8.2 Proclamation of State of Emergency

The Governor proclaims a State of Emergency based on the formal request of local governing bodies and the recommendation of Cal OES. The Governor can also proclaim a State of Emergency on his/her own initiative whenever it is deemed that the safety of persons and property in California are threatened by conditions of extreme peril, or emergency conditions are beyond the emergency response capacity and capabilities of the local authorities.

Under a Proclamation of a State of Emergency, the Governor:

- Has the right to exercise all police power, as deemed necessary, vested in the State Constitution and the laws of California within the designated area.
- Can direct all state agencies to utilize and employ personnel, equipment and facilities for the performance of any and all activities designed to prevent or alleviate actual and threatened damage due to the emergency, and can direct them to provide supplemental services and equipment to political subdivisions to restore any services in order to provide for the health and safety of the residents of the affected area.
- Is vested with the power to use and commandeer public and private property and persons, to ensure all resources within California are available and dedicated to the emergency.
- May promulgate, issue and enforce orders and regulations deemed necessary, and suspend the provisions of orders, rules or regulations of any state agency, and any regulatory statute or statute prescribing the procedure for conducting state business.

3.8.3 Proclamation of State of War Emergency

In addition to a State of Emergency, the Governor can proclaim a State of War Emergency whenever California or the nation is attacked by an enemy of the United States, or upon receipt by California of a warning from the federal government indicating that such an enemy attack is probable or imminent. The powers of the Governor granted under a State of War Emergency are commensurate with those granted under a State of Emergency.

3.8.4 Federal Declaration of Disaster or Major Emergency

If State capabilities will be exceeded, the Governor has authority to request Federal assistance, including assistance under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The Stafford Act authorizes the President to provide financial and other assistance to State and local governments, private nonprofit organizations, and individuals to support response, recovery, and mitigation efforts following Presidential Disaster or Major Emergency Declarations.

Preliminary Damage Assessment

Upon submission of the Governor's request, FEMA coordinates with the state to conduct a Preliminary Damage Assessment (PDA) and determine if the incident is of sufficient severity to require federal assistance under the Stafford Act. This process may take days to weeks, depending on the magnitude of the incident. FEMA uses the results of the PDA to determine if the situation is beyond the combined capabilities of state and local resources and to verify the need for federal assistance. The PDA also identifies any unmet needs that may require immediate attention.

Federal Analysis of the State's Request

The FEMA Administrator assesses the situation and request and makes a recommendation to the President through the Department of Homeland Security on a course of action. The decision to approve the request is based on such factors as the amount and type of damage, the potential needs of the affected jurisdiction and the state, availability of state and local government resources, the extent and type of insurance in effect, recent disaster history and the state's hazard mitigation history.

Federal Declarations without a Preliminary Damage Assessment

If the incident is so severe that the damage is overwhelming and immediately apparent, the President may declare a major disaster immediately without waiting for the PDA process described above.

Declaration of Emergency or Major Disaster

The President of the United States can declare an Emergency or Major Disaster under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 USC §5121 et seq.), thereby providing federal government resources to support the states' response and recovery activities. While Presidential Declarations under the Stafford Act release federal resources and funding to support response and recovery, federal agencies may also provide assistance under other authorities or agreements that do not require a Presidential Declaration.

3.9 Continuity of Government and Continuity of Operations

A major disaster could result in the death, absence or incapacitation of key government officials; the partial or complete destruction of established seats of government; and loss of public and private records essential to the continued operations of both government and business. To help preserve law and order and to continue or restore essential services, it is critical that local government continues to function during or following such situations. Within the context of this document, the concept of Continuity of Government is comprised of three elements:

- Standby Officers and Officials;
- Alternate Seats of Government; and
- Preservation of Vital Records and Continuity of Operations.

3.9.1 Standby Officers and Officials

City Council

The Santa Ana Municipal Code provides that if, during a Local Emergency, State of Emergency or State of War Emergency that has been proclaimed or exists under the provisions of the Emergency Services Act, it has been determined that a majority of the City Council seats have become temporarily or permanently vacant and a regular quorum no longer exists, the powers and authority of the City Council, except for those duties prescribed to the City Council in Article IV, Section 403 of the City Charter, shall vest with the Director of Emergency Services until a quorum of the regularly elected City Council Members is present, or until a sufficient number of vacancies that are determined to be permanent are filled under the provisions of Article IV, Section 403 of the City Charter.

The California Constitution and the California Emergency Services Act provide legal authority and procedures to re-constitute the City Council in the event that a Council quorum is permanently unavailable and cannot be re-established in accordance with the above paragraph.

City Officials

Each Department Director shall appoint a three-deep order of succession of appropriate subordinate management staff to succeed to their position in the event that official is unavailable or unable to serve. Persons succeeding to each office under this provision shall assume all the powers and duties of the office succeeded to immediately upon such succession, unless another delegation of authority is specified. The succeeding person shall serve until the appointing official resumes his/her office or a permanent successor is appointed under the applicable provisions of the City Charter or Municipal Code.

3.9.2 Alternate Seats of Government

The City of Santa Ana owns and operates four major properties that have the capabilities to function as the City's seat of government under emergency conditions. (These capabilities include workspace to absorb additional workforce, access to City telephone and data networks, and to receive public visitors and hold public meetings.) These major properties include:

- Santa Ana City Hall
- Santa Ana City Hall Ross Annex
- Santa Ana Corporate Yard
- Santa Ana Police Department

City Council may also designate other, non-City owned properties as alternative seats of government if needed. Options for facilities located within the City of Santa Ana could include:

- County of Orange Halls of Administration and various agency headquarters
- Santa Ana Unified School District Offices and school properties
- Rancho Santiago Community College District Offices and Santa Ana College
- Leasing or borrowing of various business or non-governmental organization properties

The City also owns several dozen other, smaller facilities, including libraries, community centers, and department sub-stations and training sites, that have workspace to absorb some additional workforce and access City telephone and data networks. City Continuity of Operations Plans (below) provide more detail on alternate sites.

3.9.3 Preservation of Vital Records and Continuity of Operations

Vital records are defined as records that are essential to:

- Protect and preserve the rights and interests of individuals, governments, corporations and other entities, which may include vital statistics, land and tax records, license registries, and articles of incorporation.
- Conduct emergency response and recovery operations. Records of this type include utility system maps, locations of emergency supplies and equipment, emergency operations plans and procedures, personnel rosters and contact lists.

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- Re-establish normal governmental functions and protect the rights and interests of government. Constitutions and charters, statutes and ordinances, court records, official proceedings and financial records would be included here.

Each City Department is responsible to prepare and maintain a Continuity of Operations Plan detailing:

- Essential Functions: Functions and duties which cannot be interrupted or must be restored within 12 hours;
- Orders of Succession and Delegations of Authority: Section 3.9.1 above
- Alternate Facilities: Alternative workspace in the event normal workspace is unusable;
- Communications and Notifications: How personnel are notified and communicate in emergencies;
- Vital Records, Databases, Systems and Equipment: Identification of those vital records, databases, and information systems and equipment necessary to resume department operations;
- Human Capital: Identification of required personnel and potential replacement personnel to perform essential functions and resume operations;
- Plans and Procedures: Testing, Training and Exercising the Plan; Plan Maintenance.

3.10 Training and Exercises

Training and exercise requirements and programs serve to advance preparedness efforts by improving individual skills and emergency management systems and procedures. Training and exercises are essential to ensure all elements of the City of Santa Ana Emergency Organization are operationally ready; this includes emergency response personnel, City departments, public officials and the public. The Standardized Emergency Management System (SEMS) and National Incident Management System (NIMS) contain mandatory training and exercise requirements, and the City will meet these requirements to ensure interoperability with other agencies and jurisdictions during emergencies and to maintain eligibility for state and federal funding opportunities. Emergency management training will be coordinated through the Santa Ana Police Department Emergency Management/Homeland Security Division and the City of Santa Ana Human Resources Department.

Additionally, implementing procedures from this Plan and/or activating the City EOC on a regular basis for low-level emergencies or pre-planned events provide excellent opportunities to train staff, test procedures and exercise plans in a low-stress and low-consequence environment.

3.10.1 City Staff Training and Exercises

3.10.1.1 Training

The City of Santa Ana recognizes the need for trained and prepared employees in order to protect lives and property, to preserve the environment, and to restore quality of life and governmental, economic and social functioning of the community during and after emergency events. Additionally, state and federal laws place emergency training responsibilities on all public employees. The purpose of this section is to provide City departments and staff with current training guidance for City employees and EOC responders.

Many City departments and staff have day-to-day emergency responsibilities for which they are trained through their individual departments outside of the guidance of this Plan. Training requirements for specialized areas of response (law, fire, EMS, etc.) are the responsibility of individual departments to identify, develop, execute and document. While some training may overlap, this Plan focuses on training for large-scale, multi-agency or multi-jurisdictional operations and coordination. All personnel who may respond to emergencies in the City Emergency Operations Center (EOC), Department Operations Centers (DOCs) or at the field level must receive the appropriate SEMS, NIMS, EOC and other specialized training as required by their specific position or function.

Training requirements of this Plan are developed under guidance from these authorities:

- State of California Standardized Emergency Management System (SEMS) training standards
- FEMA's National Incident Management System (NIMS) Training Program
- California Office of Emergency Services (Cal OES) EOC Training and Credentialing standards
- Requirements of state or federal emergency management or homeland security grant programs
- Emergency training policies or requirements adopted by the City of Santa Ana

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The training requirements of these standards and programs will evolve over time. The Police Department Emergency Operations Coordinator shall be responsible for identifying current City, state and federal emergency training requirements for all employees based on their emergency roles and responsibilities. Current training requirements will be maintained in an Appendix to this Plan, which shall be considered a mandatory training policy for the City of Santa Ana to ensure compliance with SEMS, NIMS and grant programs. The Emergency Operations Coordinator shall be responsible for providing or facilitating the required training to City staff, either in-person within City training sessions, in conjunction with the Orange County Operational Area, through on-line training, or through external classes or instructors, depending on the current training requirements and availability of classes. The City of Santa Ana Human Resources Department shall maintain employee records of completed training. Individual City departments are responsible for identifying, executing and documenting training for department personnel with department-specific emergency responsibilities.

Training requirements for each employee are determined based on the specific roles or responsibilities assigned to them for emergency operations. These emergency responsibilities fall into four primary categories (some employees may fall into more than one category and other specialized training categories may exist for others):

- All Public Employees - All permanent City employees, as public employees in the State of California and as members of the City's Emergency Organization, must complete Disaster Service Worker orientation, SEMS orientation, NIMS, and ICS introduction courses.
- EOC Responders - All City employees assigned to fulfill EOC staff positions must complete EOC orientation, EOC operations, and EOC section- or position-specific training courses for their assigned duties.
- Field ICS Responders - City staff with responsibility to implement ICS supervision or command in field response operations (primarily Santa Ana Police Department) must complete higher level ICS training.
- Department-specific Responders - Individual City Departments may have emergency duties or responsibilities specific to the department which require additional specialized training; for example, training in mass care and shelter, safety and damage assessments, public information or emergency notifications, or implementation of department-specific SOP's or responsibilities.

City staff should refer to the Emergency Operations Coordinator for the training requirements of their duties and assignment(s).

3.10.1.2 City Staff and Department Exercises

Exercises are conducted to maintain the readiness of operational staff. Exercises provide personnel with an opportunity to practice and become familiar with relevant procedures, facilities, and systems that will actually be used in emergencies and to test those procedures, facilities, and systems to identify potential improvements. Specifically, exercises:

- Train personnel in roles and responsibilities and clarify roles and responsibilities
- Test and evaluate plans, policies and procedures
- Reveal planning weaknesses and gaps in resources
- Improve inter-agency coordination and communications
- Gain public recognition and support of officials
- Satisfy government requirements

The format, subject matter and scheduling of exercises shall be a joint responsibility of all City Departments, facilitated by the Emergency Operations Coordinator. Exercises may be held with:

- Emergency Operations Center staff, to test EOC procedures and systems,
- City Departments, to test department SOP's, duty assignments and checklists,
- The Orange County Operational Area, to test multi-jurisdictional and regional coordination,
- Partner agencies (e.g., Orange County Fire Authority, Santa Ana Unified School District, Orange County Health Care Agency, American Red Cross) to test multi-agency interoperability,
- Notification systems and EOC systems and equipment, to ensure operational condition.

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There are six primary types of exercises, which increase in complexity, realism and stress:

Seminars

Seminars are a discussion-based introduction or overview of plans, policies, procedures, equipment, resources, or concepts. Seminars provide an educational foundation for the topic area in a low-stress environment, for large or small groups, at little or no cost.

Workshops

Workshops are discussion-based exercises used to develop a work product, such as a policy, checklist, procedure, exercise plan or other document. Workshops are a smaller-group format of those with subject matter expertise or relevant input or perspective, in a low-cost and low-stress environment.

Tabletop Exercises (TTXs)

TTXs involve key staff or officials in a discussion-based exercise for a simulated or hypothetical situation. This type of exercise is intended to stimulate constructive discussion as participants talk through the implementation of plans, policies or procedures; participate in group problem solving; practice information sharing or inter-agency coordination processes; or facilitate the understanding of concepts and plans. TTX's are low-cost but with slightly increased preparation, formality and stress.

Drills

A drill is a narrowly focused, supervised, activity-based exercise employed to test a single specific function or operation. Drills are used to test or provide experience on equipment, to test systems or procedures, or to practice current skills. Drills provide measurable results and rapid feedback against established performance standards. Drills are low-cost with slightly increased stress and may test EOC activation or set-up procedures, callouts or notifications, building evacuation or lock-down, or other specific functions.

Functional Exercises (FEs)

A FE is a fully simulated, interactive (activity-based) exercise. It is designed to assess the capability of a jurisdiction to respond to an emergency by testing multiple activities, functions or interdependent groups of functions from the Emergency Operations Plan. Events are projected through a realistic but simulated scenario, with time-driven updates to drive decision-making and responses, including the simulated deployment of resources and movement of personnel and equipment. The objective of a FE is to execute specific plans and procedures and apply established policies under crisis conditions, within or by particular teams or officials. A FE requires considerable planning and preparation, may carry some cost, and is performed in a higher stress environment.

Full-Scale Exercises (FSEs)

In a FSE, response elements mobilize and deploy to one or multiple designated sites in response to a simulated incident, testing major portions of operations plans and organizations. Actual mobilization and movement of personnel and resources in the field are required to demonstrate coordination and response capability. EOCs and command posts are activated. A FSE is used to evaluate the operational capabilities of systems; to demonstrate inter-departmental and inter-agency communication, coordination and cooperation; to practice activating and allocating personnel and equipment and to test their capabilities; and to test communication systems and procedures, all under field conditions and over an extended time. Although pre-scripted events may be used, the exercise is primarily driven by player actions and decisions. A FSE is the largest, most costly, highest stress and most complex exercise type and may involve participation of multiple agencies and levels of government.

3.10.2 Public Awareness and Education

The public's response to an emergency will be based on their understanding of the emergency, the potential hazards, the likely response of emergency services, and knowledge of what they should do to maximize their chances of survival and recovery. Public awareness and education prior to an emergency are critical to minimize the impact when an emergency occurs and to speed the community's return to normal function. Public awareness and education programs should be viewed as equally important to all other emergency preparedness efforts.

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A primary component of public education in the City is the Community Emergency Response Team (CERT) program, which is designed to prepare citizens to help themselves, their families and their neighbors in the event of a catastrophic disaster. CERT training includes basic skills important in disaster response, including personal preparedness, fire suppression, medical care and light rescue. Professional emergency services personnel will not be able to help everyone immediately; CERT training can make a difference in saving lives and protecting property throughout the community.

Chapter 4 – Emergency Operations Center (EOC) Functionality

4.1 Emergency Operations Center Purpose and Organization

4.1.1 EOC Purpose and Functions

The Emergency Operations Center (EOC) is the facility where representatives of all City departments and key external agencies join together to coordinate and manage the City's response to a large-scale emergency or disaster event. The EOC provides a central location of authority and information and allows for face-to-face coordination among personnel who must make emergency decisions or facilitate emergency actions. This enables a rapid and coordinated response by the Director of Emergency Services/EOC Director, emergency management staff, and all departments and organizations with emergency responsibilities.

The EOC provides information management, resource management, interagency coordination and executive decision-making through:

- Gathering, verifying and analyzing information on the incident;
- Preparing status reports and situation updates of incident information;
- Sharing information among all City departments and external agencies;
- Disseminating emergency information or warnings to the public;
- Setting priorities and establishing objectives for managing the incident;
- Coordinating operations of City departments and providing support to field responders;
- Acquiring and allocating needed resources;
- Resolving conflicts among competing needs or priorities; and
- Maintaining cost accounting, cost recovery and other incident documentation.

4.1.2 EOC Organization

The emergency response of the City of Santa Ana is an extension and expansion of day-to-day operations of City departments and staff. Emergency operations rely on the normal authority and responsibilities of City departments, plus emergency powers that may be invoked by executive authority under Emergency Proclamations. This section describes the organizational roles and responsibilities in the City of Santa Ana EOC and identification of the organizations and individuals responsible for staffing each position.

In compliance with ICS, SEMS and NIMS, the EOC is structured around the five essential emergency functions necessary to fulfill the emergency management and coordination role of local government: Management, Operations, Planning, Logistics and Finance & Administration.

The organizational structure described in this section presents the City's ultimate capability and full staffing of all potential EOC positions. The ICS system is intended to be flexible, modular, and scalable; the specific needs of the incident will define the level of activation and which EOC positions need to be staffed. If the organization is not fully expanded, supervisory positions are responsible for performing the functions of any un-staffed Units, Groups, Branches, or Sections that they oversee. For example, the Finance & Administration Section Chief may determine it is unnecessary to staff the Timekeeping Unit, and instead assume the responsibility for ensuring any functions of that Unit that may arise are performed.

4.1.2.1 EOC Organization Chart and Department Responsibilities

The figures below provide the EOC Organization Chart for a full activation of all EOC positions and the City departments or agencies responsible for each. Titles in bold at the top of each box indicate the EOC/ICS position title; titles in italics below indicate the titles of City or agency staff assigned to fill the

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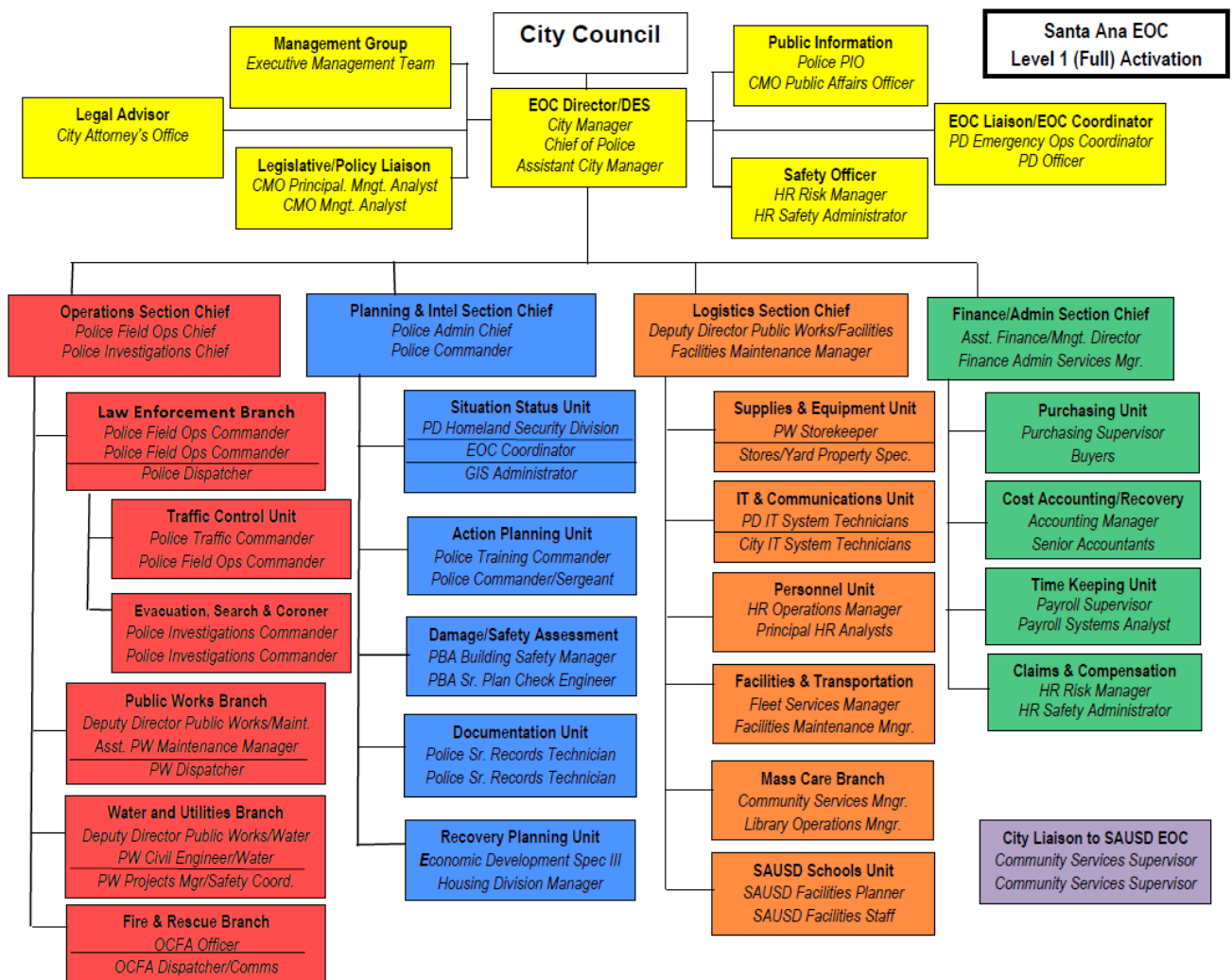
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EOC position. Each box lists a primary and alternate title to fill the position, but the department or agency responsible for the position is responsible to ensure a sufficient number of staff are trained and prepared to assume or support that position in an emergency.

Each position on the Org Chart may be expanded or supported with additional staff, working either in the EOC or from their normal job location, if needed. For Level 2 or 3 Activations (lower level activations described in Section 4.2 below), EOC positions may be delegated to alternate or lower-ranking staff. Hazard-Specific Annexes in Part III of this EOP contain suggested Org Charts specific to each type of hazard event. Additionally, EOC staffing is always dependent on who is available to respond during emergency or disaster conditions; Org Chart assignments may, at least initially, need to be made from those present and available, until pre-designated staff arrive and assume their positions.

The Department or Agency assigned responsibility for a position or duty in the EOC is also responsible (with support from the Emergency Operations Coordinator and other relevant departments) for developing all implementing plans and procedures; acquiring the supplies, equipment or resource support; and identifying, training and deploying the staff necessary to fulfill the responsibility.

Figure 142 Santa Ana EOC Full Activation Organization Chart



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Figure 143 Department or Agency / EOC Position Staffing Responsibilities

Department or Agency / EOC Position Matrix of Staffing Responsibilities																																			
Department or Agency P = Primary Responsibility S = Support Responsibility	Management Section						Operations Section					Planning/Intelligence Section					Logistics Section						Finance/ Administration Section												
	EOC Director/DES	Management Group	Legal Advisor	Legislative/Policy Liaison	Public Information Officer	Safety Officer	EOC Liaison/EOC Coordinator	SAUSD EOC Liaison	Operations Section Chief	Police Branch Director	Traffic Control Unit	Evacuation, Search & Coroner	Public Works Branch Director	Water and Utilities Branch	Fire and Rescue Branch	Planning/Intelligence Section Chief	Situation Status Unit	Damage Assessment Unit	Action Planning Unit	Documentation Unit	Recovery Planning Unit	Logistics Section Chief	Supplies & Equipment Unit	IT & Communications Unit	Personal Unit	Facilities & Transportation Unit	Mass Care & Shelter Branch	SAUSD Schools Branch	Finance/Admin Section Chief	Purchasing Unit	Cost Accounting/Cost Recovery	Timekeeping Unit	Claims & Compensation Unit		
City Manager's Office	P	S			P	S																													
City Attorney				P																										S				S	
City Clerk				S																S															
Executive Management Team		P																																	
Community Development Agency																					P							S							
Finance and Management Services	S																													P	P	P	P		
Human Resources						P																			P										P
Information Technology																	S							P											
Library Services																												S							
Orange County Fire Authority															P				S																
Parks, Recreation & Comm. Services								P																				P							
Planning and Building Agency	S																	P		S															
Police Department	P				P		P		P	P	P	P	P			P	P		P	P		P	P	S			S								
Public Works Agency	S										S	S	P	P			S				S	P	P			P									
Santa Ana Unified School District																											S	P							

4.1.3 EOC Position Descriptions

See Chapter 6 for a detailed description and checklist for each EOC position.

4.1.3.1 Management Section

In the EOC, the Management Section is responsible for overall emergency response policy and coordination through the joint efforts of City Departments, partner agencies and external organizations. This includes management and coordination of response and recovery efforts, overseeing the Operations, Planning/Intelligence, Logistics and Finance/Administration Sections, coordinating with other government agencies and the private sector, establishing priorities and resolving conflicts, providing authority to act, and preparing and disseminating emergency public information.

The Management Section consists of the:

- Director of Emergency Services (DES)/EOC Director
- EOC Management Group
- Legal Advisor
- Legislative and Policy Liaison
- Public Information Officer
- EOC Safety Officer
- EOC Liaison/EOC Coordinator

4.1.3.2 Operations Section

The Operations Section is responsible for coordinating incident and mutual aid support for the tactical operations of City departments and external agencies responding to the emergency. The Operations Section

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Chief and Branch Directors are responsible for coordinating with their counterparts in Incident Command Posts and field responders to identify and seek out needed response resources and support on their behalf. In addition, there may be situations in which departments can better respond to an incident if their resources are pooled and coordinated in a unified effort through the EOC.

The Operations Section consists of the:

- Operations Section Chief
- Law Enforcement Branch
 - Traffic Control Unit
 - Evacuation, Search & Coroner Unit
- Public Works Branch
- Water & Utilities Branch
- Fire & Rescue Branch

4.1.3.3 Planning & Intelligence Section

The Planning & Intelligence Section is responsible for collecting, evaluating, and disseminating situational information pertaining to the emergency. This section maintains information and intelligence on the current and forecasted situations and gathers and disseminates information and intelligence critical to the incident. Personnel prepare and develop the EOC Action Plan (EAP), situational status reports and incident maps.

The Planning & Intelligence Section consists of the:

- Planning & Intelligence Section Chief
- Situation Status Unit
- Damage & Safety Assessment Unit
- Action Planning Unit
- Documentation Unit
- Recovery Planning Unit

4.1.3.4 Logistics Section

The Logistics Section is responsible for providing facilities, services, transportation, personnel, equipment, food service, communications and other resources for EOC operations and to support responders in the field. This may include utilizing City resources, ordering resources through appropriate procurement systems, or utilizing mutual aid, private sector or volunteer resources.

The Logistics Section consists of the:

- Logistics Section Chief
- Supplies & Equipment Unit
- IT & Communications Unit
- Personnel Unit
- Facilities & Transportation Unit
- Mass Care & Shelter Branch
- Schools Unit

4.1.3.5 Finance & Administration Section

The Finance & Administration Section provides financial and administrative services to support EOC and response activities. In complex scenarios involving expenditures from multiple sources, the Finance & Administration Section monitors multiple sources of funds and reports on the financial “burn rate” as the

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incident progresses. This allows EOC Management to forecast the need for additional funds before operations are negatively affected. The Finance & Administration Section also monitors expenditures to ensure applicable statutory rules are met. Close coordination with the Planning & Intelligence and Logistics Sections is essential so operational records can be reconciled with financial accounting. This Section maintains records on personnel and equipment time, provides payments to vendors for supplies and equipment, and determines cost considerations of strategies associated with incident planning.

The Finance & Administration Section consists of the:

- Finance & Administration Section Chief
- Purchasing Unit
- Cost Accounting/Cost Recovery Unit
- Timekeeping Unit
- Claims & Compensation Unit

4.2 Emergency Operations Center Locations

The primary EOC for the City is in the Santa Ana Police Department, at 60 Civic Center Plaza. The Police Department Emergency Management/Homeland Security Division has primary responsibility for the readiness and operation of this facility, supported by the Police Department Information Services Division.

The alternate EOC is the Santa Ana Corporate Yard, Building A, at 215 South Center Street. The Police Department Emergency Management/Homeland Security Division has primary responsibility for the readiness and operation of this facility, supported by the Santa Ana Public Works Agency.

4.3 Emergency Operations Center Activation, Mobilization and Staffing

4.3.1 Criteria for EOC Activation and EOC Activation Levels

The EOC may be activated to serve either of two general purposes. The EOC may be activated to coordinate support and assistance to Incident Command Posts and/or responders in the field- particularly if there are multiple emergency incidents or events occurring simultaneously. Or the EOC may be activated to centrally manage a citywide emergency or event that does not have a specific Incident Command in the field (e.g. extreme heat, widespread power failure, or disease outbreak). Additionally, the EOC may be activated to support or manage a pre-planned or non-emergency event that meets any combination of the below criteria.

Criteria indicating a need to activate the EOC may include:

- Multiple City departments and agencies are responding,
- Multiple emergency incidents or events are occurring,
- City personnel and resources are being depleted,
- The City is requesting/receiving resources from outside the City,
- The event may extend for more than one operational period (shift) or may escalate over time,
- There is significant impact to the public, requiring emergency warnings or protective actions,
- The City proclaims a Local Emergency,
- The Governor proclaims a State of Emergency or State of War Emergency for the City,
- Significant City resources are being deployed outside of the City in a mutual aid response.

4.3.2 EOC Activation Levels and Staffing

SEMS and NIMS systems recognize three levels of EOC activation, depending on the needs of the event. Activation levels may change during the course of the event, as the situation may escalate or de-escalate:

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Level 1 Activation – Full Activation:

Level 1 is a Full Activation for a major emergency or disaster causing widespread threat to life and property and overwhelming City Departments, staff and resources. Level 1 Activation includes extensive coordination and communication among City departments and external agencies; acquisition and coordination of significant resources and mutual aid beyond the capabilities of the City; coordination with elected officials and other governmental entities; and multiple warnings and instructions to the public. A Level 1 Activation would generally supersede or displace most or all other City government functions and activities and will likely require a sustained response lasting for multiple operational periods or days.

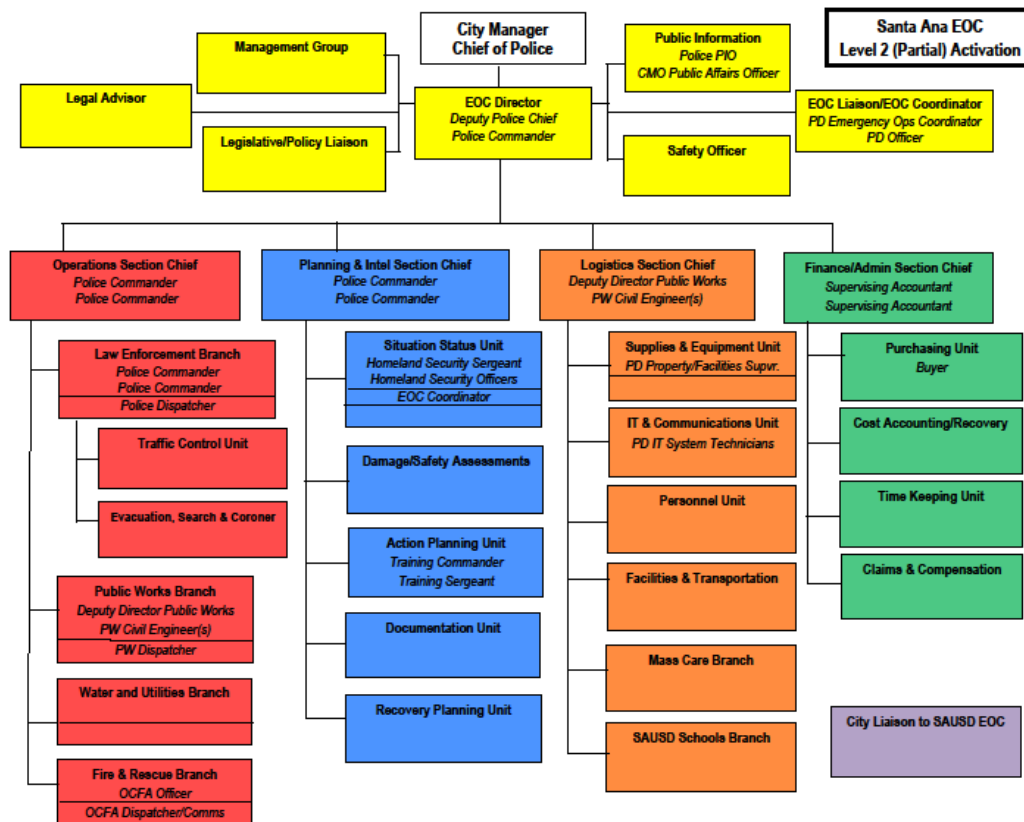
Staffing for Level 1 Activation would generally include all EOC positions and functions as detailed in the Organization Chart and Position Descriptions in Section 4.1 above. The Director of Emergency Services/EOC Director does have discretion to delegate assignments or place some positions on-call.

Level 2 Activation – Partial Activation:

Level 2 is a Partial Activation for moderate or serious emergencies that are generating a noticeably increased pace and volume of calls for service and the use of City staff and resources must be prioritized to protect lives and property and to stabilize and contain the emergency. The EOC may be utilized to support field responders; to assist with communications among City Departments, external agencies and the public; to acquire and manage resources and mutual aid; and to otherwise participate in the response to the emergency. However, Level 2 Activation emergency may not be overwhelming; some EOC functions may not be required and some City government functions may continue uninterrupted at the same time.

A sample Level 2 Org Chart is provided in Figure 146, but as with any ICS organization, positions may be activated or de-activated at the discretion of the EOC Director, depending on the needs of the specific event.

Figure 146 Santa Ana EOC Organization Chart – Level Two



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Level 3 Activation – Minimal Activation:

Level 3 is a Minimal Activation utilized to open communications and monitor events in a low-level emergency or for non-emergency events. City staff and departments would be responding to calls for service at a normal or slightly increased pace and volume, and should have sufficient resources to meet the needs of the emergency. The EOC would generally not be supporting responders or managing resources. A Level 3 Activation may be used when there is warning that an emergency may occur, when there is concern that a low-level emergency may escalate, or when the City may be impacted by an emergency occurring in another jurisdiction.

Anticipated staffing for a Level 3 Activation would be:

- EOC Manager - Police Department Deputy Chief, Commander or Sergeant
- EOC Liaison/EOC Coordinator - Police Department Emergency Operations Coordinator
- Situation Status Unit - Police Department Homeland Security Division Officer(s)
- At the discretion of the EOC Manager:
 - Public Information Officer(s)
 - Police, Fire and/or Public Works Department Branch Directors or Liaisons
 - Other staff as requested

4.3.3 Authority to Request and Activate the EOC

4.3.3.1 Recognizing the Need to Activate the EOC

The need to activate the EOC may be immediately obvious (such as for a damaging earthquake) or it may develop gradually as calls for service escalate or resources become stretched thin. In some cases, the City may receive a warning or forecast of an impending event.

As stated above in Chapter One: Emergency response personnel, City officials and staff are encouraged to request support and resources proactively and to discuss or suggest implementation of this Plan or activation of the EOC if it would assist in the successful resolution of an incident. There is little harm in early activation, but consequences for a delayed or missed activation could include lost lives or property or a public perception that the City responded slowly or inadequately.

Recognition of the need to activate the EOC may originate from a variety of sources, including:

- The Police Department Watch Commander or Communications Division are alerted to a significant event through 911 calls or notification systems, or observing escalating calls for service;
- Notification from Orange County Fire Authority Officers or Communications Division of a significant event or escalating calls for service;
- An Incident Commander or Incident Command Post in the field requests assistance;
- A City Department or Department Operations Center requests assistance from or coordination with other departments or agencies;
- The Police Department Emergency Management/Homeland Security Division or Emergency Operations Coordinator receives warnings or notifications of developing or impending events.

4.3.3.2 Requesting Activation

Any person described in 4.3.3.1 above who recognizes a need to activate the EOC should confer with one of the following officials, who can request activation of the EOC:

- Any City Department Director or person acting in that capacity
- Any member of the Police Department Command Staff
- Any Chief Officer of Orange County Fire Authority
- The Emergency Operations Coordinator

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4.3.3.3 Authorization to Activate

The following individuals, upon request from any official listed above in 4.3.3.2 or upon their own discretion, are authorized to activate the EOC:

- The City Manager, Acting City Manager, or person acting in that capacity in accordance with Section 3.3 above; (Director of Emergency Services line of succession)
- Chief of Police, or Assistant or Deputy Chief of Police acting in that capacity;
- Assistant City Manager or Deputy City Manager
- OCFA Division 6 Chief, or OCFA Chief Officer acting in that capacity;
- For EOC Level 3: Any of the above, or any member of the Police Department Command Staff.

4.3.4 EOC Activation and Mobilization

The Police Department will maintain an EOC Activation Team consisting of:

- Emergency Management/Homeland Security Division Commander
- Emergency Operations Coordinator
- Emergency Management/Homeland Security Division Sergeant and Police Officers
- Police Department IT Systems Technicians
- Additional Police Department staff trained on the operation of EOC systems and technology

This EOC Activation Team will serve as a rapid notification and response team whose purpose is to make the EOC operational for incoming EOC staff, make the notifications to mobilize EOC staff, and provide incoming EOC staff with access and entry to the EOC facility.

To activate and mobilize the EOC:

1. The official authorizing EOC activation (from Section 4.3.3.3 above) will:
 - a. Determine the EOC Activation Level:
 - i. Level 1 - Full Activation for a major emergency, displacing all or most other City functions,
 - ii. Level 2 - Partial Activation for a moderate emergency, but maintaining some City functions,
 - iii. Level 3 - Minimal Activation, to open communications and monitor events.
 - b. Notify the Police Department Homeland Security Commander or Watch Commander to initiate the activation.
2. The Police Department Homeland Security Commander or Watch Commander will notify the EOC Activation Team, via telephone callout list or AlertOC notification system, of:
 - a. The hazard event necessitating activation,
 - b. EOC activation level.
3. The EOC Activation Team will:
 - a. Respond to the EOC and make it operational (unlock the facility, begin activating IT systems),
 - b. Notify EOC staff (in accordance with the designated activation level) to respond, via telephone callout list or AlertOC notification system,
 - c. Activate the check-in process to receive incoming EOC staff.

4.3.5 EOC Deactivation

The duration of an EOC activation is dependent on the severity of the emergency. For pre-planned events or small incidents with few recovery concerns, the activation might be limited to one operational period or even several hours. In major situations, the EOC may be activated for weeks or months, as operations evolve

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from response to supporting long-term recovery of the community. The DES/EOC Director has authority to determine when it is appropriate to deactivate the EOC or down-staff to a lower activation level.

Deactivation typically occurs when on-scene response activities have ceased, when it is determined that on-scene personnel have the incident fully contained and there is limited or no possibility of escalation, when the incident has become small and specific enough that a single Department can manage the incident, or when a long-term recovery organization assumes responsibility for the event.

Once the decision has been made to deactivate the EOC, reducing EOC activities will occur in a phased process. Depending on the magnitude of the incident and the associated response, this phased process may be implemented over days, hours or even minutes, as determined by the DES/EOC Director. The phases are as follows:

Operations Section - The Operations Section will typically be the first to deactivate as on-scene operations end. The Operations Section Chief and Branch Directors will develop a Demobilization Plan with the Action Planning Unit in the Planning & Intelligence Section, identifying Operations Section Units and staff that can be released as operations cease.

Logistics Section - The Logistics Section will support the Operations Section's deactivation. It will begin closing down facilities and reclaiming or disposing of resources that were used to support emergency workers. It will also assist in accounting for resources, determining their status, returning or disposing of response resources, and reporting status, costs, and losses to the Finance/Administration Section.

Planning & Intelligence Section - Following deactivation of the Operations and Logistics Sections, the Planning Section will deactivate. The Planning Section remains active while the Operations and Logistics Sections deactivate in case complications with field demobilization or resource management arise that might need to be addressed strategically. In addition, the Planning Section, Action Planning Unit assists in developing the demobilization plan for the Operations and Logistics Sections. Should questions arise or revised strategies be needed, the Planning Section will be available during this critical time.

Finance/Administration Section - The Finance & Administration Section is the next to last element to cease operations because it is responsible for identifying all associated costs (including demobilization costs), and leading cost recovery efforts. It may sometimes take considerable time to ensure all appropriate documentation is gathered from the other sections and to validate costs. Furthermore, complete cost accounting for the operation cannot be determined until all other sections have fully deactivated.

Management Section - The DES/EOC Director is accountable for all emergency management activities occurring in the EOC from start to finish. Therefore, the Management Section is last to deactivate. The DES/EOC Director will typically receive a debriefing from Section Chiefs as they cease operations. Once the last Section Chief has provided his/her debrief and the DES/EOC Director is confident that operations are terminated and all resources are accounted for, deactivation is complete. At any time throughout the deactivation process, the DES/EOC Director may dismiss elements of the Management Section.

All EOC Staff -As staff are released from the EOC, they will perform the following Demobilization activities:

- Close out activity logs. Complete all assigned forms, reports and documentation.
- Submit all forms and logs to the Planning Section, Documentation Unit, prior to departure.
- Notify their City Departments, DOCs or other agencies of the deactivation.
- Ensure any open actions not yet completed will be handled after deactivation.
- Be prepared to provide input to the after-action report.

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Following an EOC activation, the Emergency Operations Coordinator will be responsible for restoring the EOC to a state of readiness. This may include:

- Cleaning services for the EOC facility.
- Servicing equipment and/or coordinating repairs.
- Restocking EOC supplies.
- Reorganizing and rearranging furniture or other resources.

4.4 Emergency Operations Center Initial Activities and Action Planning

4.4.1 Initial Activities

Certain initial activities should occur upon activating the EOC for any hazard or event (more specific activation instructions and contact details are maintained in the EOC Activation Manual):

- EOC staffing and operational status:
 - Ensure the EOC is fully staffed in accordance with the activation level and activated EOC sections; locate and summon alternate or successor staff for any positions for whom the primary is unavailable. Draft an EOC Organization Chart with names and contact information of staff.
 - Ensure the EOC is physically operational and supplied; identify and remedy any deficiencies in supplies, equipment or systems.
- Notifications and communications:
 - Notify appropriate City officials, departments and partner agencies when the EOC is operational.
 - Establish communication with any of the following activated in the City (see Section 4.6):
 - Incident Command Posts (ICPs) or Mobile Command Posts
 - City Department Operations Centers (DOCs) or OCFA Division 6 Area Command
 - Other facilities activated, such as shelters or staging areas
- Establish a baseline of situational awareness by:
 - Assess City staff and facilities for injuries, damages or impacts to City operations.
 - Consult City Departments with dispatch operations (Police, Fire, Public Works, Planning & Building) for the volume and nature of calls for service received and the adequacy of resources.
 - Consult Operational Area status reports and WebEOC for impacts to other jurisdictions.
- Determine the need for any warnings, notifications or instructions to the public, and on what timing.
- Initiate an EOC planning process:
 - Consult Part III of this EOP for a Hazard-Specific Pre-Plan (if applicable).
 - Initiate the EOC Action Planning Process (Section 4.4.2 below)

4.4.2 EOC Action Planning

Action planning is an important management tool that provides responding personnel with knowledge of the objectives to be achieved and the steps required for achievement. Action plans provide direction to responders and provide a basis for measuring achievement of objectives and overall system performance. Action planning involves two essential elements:

- A process for identifying priorities and objectives for emergency efforts.
- Determining specific tasks, assignments and resources required to meet the objectives.

Action plans are developed for a specified operational period, which may range from a few hours at the start of an event or an event of short duration, to multiple days as an event stabilizes and response transitions to recovery. Operational periods frequently correspond to shift changes, but are not required to. The typical operational period is 12 hours, but specifically may be determined by:

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1. Establishing and prioritizing the actions that need to be taken,
2. Assessing the resources available to perform the actions,
3. Determining what actions the available resources can accomplish before requiring shift change, rest, resupply or other transition.

There are two kinds of Action Plans—Incident Action Plans in the field and EOC Action Plans in the EOC. The format and content for action plans at the incident level and EOC level will vary but the process for developing action plans is similar.

Incident Action Plans (Field Level)

At the field level, action plans developed for use at incident scenes are called Incident Action Plans (IAPs). Incident Action Plans are required for each operational period and may be verbal or written. Written Incident Action Plans are recommended for complex incidents, multi-agency or multi-jurisdictional incidents or long-term incidents with operational periods and shift changes.

Specific ICS forms are used to prepare written Incident Action Plans. The format for an Incident Action Plan generally includes these elements:

- Incident scenario or briefing
- Incident objectives and priorities.
- Primary and alternative strategies to achieve incident objectives.
- Specific tactics appropriate to the selected strategy.
- The kinds and number of resources to be assigned (determined by the tactics to be used).
- The operational organization needed to accomplish the strategy and tactics, including the support organization of logistical, planning and finance/administration functions.
- A communications plan.
- Other supporting documentation needed (an incident map, key facilities, safety messages, medical support plan, weather reports, etc.)

EOC Action Plans (EOC Level)

The primary focus of the EOC Action Plan is on jurisdictional issues. The plan sets overall objectives for the City and establishes priorities as determined by the Director of Emergency Services/EOC Director and EOC Section Chiefs, focusing on supporting response operations in the field and restoring and maintaining City functions and services. It can include mission assignments to City departments; provide policy and cost constraints; provide for inter-agency/interjurisdictional coordination; and support public information and messaging. The EOC Action Plan becomes an essential input to developing objectives and task assignments for City departments and agencies.

The EOC Planning & Intelligence Section is primarily responsible for developing the action plan and facilitating action planning meetings, although all EOC sections contribute to the plan. Action planning at the EOC level also uses operational periods. The length of the operational period for the EOC is determined by first establishing a set of objectives and priority actions that need to be performed, and then establishing a reasonable time frame for accomplishing those actions with the resources available.

EOC Action Plans should not be complex or require a time-consuming process. The initial EOC Action Plan may be a verbal plan put together immediately after EOC activation. Once the EOC is fully activated, EOC Action Plans should be written. The format may be simpler than IAPs at the field level, but the EOC Action Plan generally covers the same elements:

- Incident scenario or briefing
- Listing of priorities and objectives to be accomplished.
- Strategies to achieve the incident objectives.

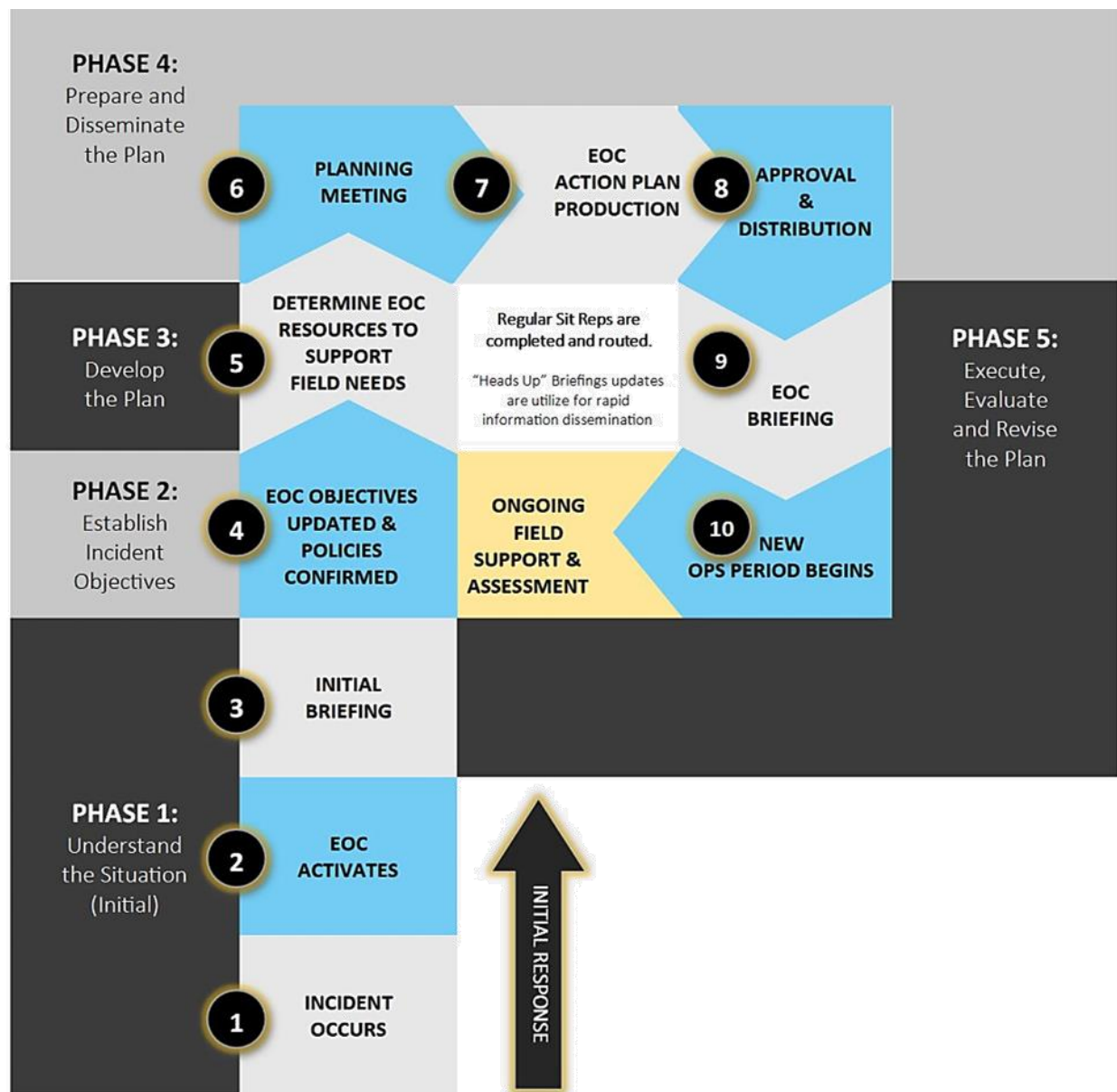
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- Assignments, actions and resources necessary to implement the strategies.
- Operational period to accomplish the actions.
- Organizational elements to be activated to support the assignments. Later EOC Action Plans may list organizational elements to be deactivated during or at the end of the period.
- A communications plan.
- Other supporting documentation needed (incident map, key facilities, safety messages, medical support plan, weather reports, etc.)

4.4.3 EOC Action Planning P and Planning Phases

Action planning in the EOC follows a specific process that repeats in a cycle for each operational period throughout the duration of the emergency. This cycle, called the “Planning P”, is depicted in below:

Figure 152 EOC Planning P



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The Planning P consists of 10 planning steps arranged into five phases. These phases and steps are:

- Phase 1 - Understand the Situation
 - Step 1 - Incident Occurs
 - Step 2 - EOC Activation
 - Step 3 - Initial Briefing
- Phase 2 - Establish Incident Objectives
 - Step 4 - Objectives and Policies Meeting
- Phase 3 - Develop the Plan
 - Step 5 - Resource Meeting / Determine EOC Resource Needs
- Phase 4 - Prepare and Disseminate the Plan
 - Step 6 - Planning Meeting / Validate Objectives and Resources
 - Step 7 - Compile and Assemble the Plan
 - Step 8 - Approve and Distribute the Plan
- Phase 5 - Execute, Evaluate and Revise the Plan
 - Step 9 - EOC Staff Briefing
 - Step 10 - Operational Period Begins

Phase 1 (Steps 1-3), represented by the leg of the P, is the Initial Response to the emergency and is only performed once at the onset of the event. For each additional operational period, this phase drops off and phases 2-5 repeat in a “Planning O” cycle. Refer to the EOC Action Planning Annex in Part II, Chapter 7 of this Plan for a guide to EOC Action Planning and an EOC Action Plan template.

4.5 Emergency Operations Center Situational Awareness and Information

4.5.1 Situational Awareness and Essential Elements of Information

Situational awareness includes gathering, recording, analyzing and displaying information on the emergency and status of resources. The purpose is to ensure decision-makers in the EOC have a clear picture of the magnitude, complexity and potential impact of the incident. Having this information and the ability to communicate it to other entities involved in incident response and coordination is essential to the effective, efficient and safe management of the incident.

Essential Elements of Information (EEI) is defined as the information required to promote informed decision-making during an emergency or incident. Categories of EEI include:

- Lifesaving needs – Information on any current or anticipated threat to life safety or any actions necessary to protect life. This can include support or resources to emergency responders in the field, or protective actions such as warnings, evacuation or distribution of emergency food, water or medical supplies.
- Critical infrastructure – Information on the status of transportation systems, communications systems (phone, broadcast and internet), and utilities (power, gas, water and wastewater).
- Critical resources – Information on the status of resources vital to the response effort, including staffing (employees, volunteers and partner agencies); vehicles; fuel, food and water supplies; medical supplies and equipment; or other tools, supplies or equipment vital to the response.
- Critical facilities – Information on the status of City facilities, police/fire stations, hospitals and medical providers, schools, utility substations or plants, and communications network facilities.
- Impacted individuals – Information on individuals who have been displaced, the extent of damage to housing, and the need for financial assistance or disaster relief services.
- Risk of further damage – Information on potential for further damage presented by the emergency that could lead to a worsening of the situation. This may include damage or potential damage to dams, storm or flood control facilities; hazardous materials facilities; or utilities infrastructure.

4.5.2 Sources of Essential Information

Essential information can flow into the EOC from, or EOC staff can seek information from, a variety of sources, which may include:

- Reports from incident command posts or first responders in the field,
- Reports from City departments or Department Operations Centers,
- Results of windshield surveys (vehicle-based damage assessment surveys),
- Viewing of security or traffic cameras throughout the City,
- Reports from the public to Department hotlines or dispatch centers,
- Reports from other jurisdictions or agencies (Santa Ana Unified School District, Orange County Operational Area, other city/county/governmental agencies),
- News media reports or reports from social media postings or inquiries,
- Data from agency websites (e.g. weather, utility services, transportation or warning systems).

The Situation Status Unit in the Planning & Intelligence Section of the EOC has primary responsibility for gathering, evaluating, displaying and distributing situation status information, but all EOC sections and positions may play a role in gathering or reporting information or disseminating it to appropriate parties.

4.5.3 Situation Status Reports and Dissemination of Information

Situational awareness and EEI are compiled into Situation Status Reports to provide EOC staff and other emergency responders with current incident information. Situation Status Reports form the basis for EOC staff briefings and for the development of EOC Action Plans and EOC objectives, and also may be used to communicate situation information to other responding agencies or jurisdictions.

Situation Status Reports may contain current and potentially sensitive information, such as response operations, status of resources, and private contact information for individuals or agencies. Situation Status Reports are not distributed to the public, media, or any persons or agencies not directly involved in response operations. However, information derived from Situation Status Reports may be utilized to prepare public or media releases or to brief other parties, with the authorization of the EOC Director.

WebEOC

All governmental jurisdictions within the Orange County Operational Area utilize WebEOC as the crisis information management system for real-time information sharing during any multi-jurisdictional incident or emergency. WebEOC is an internet-based program for electronically sharing disaster information within the EOC and with the County/Operational Area EOC, and all other Operational Area jurisdictions and supporting agencies.

The WebEOC system may be used for:

- Maintaining individual activity logs by each position in the EOC.
- Posting and monitoring significant events taking place in the City and throughout the Operational Area.
- Showing all jurisdictions and supporting agencies activated for or supporting the emergency or incident.
- Providing and sharing situational status information from all jurisdictions and supporting agencies involved in the response, with display capabilities within the EOC.
- Compiling and documenting all situation status information and updates for the City throughout the response period, with display capabilities within the EOC.
- Coordinating resource requests and resource sharing with the Operational Area and among all other responding jurisdictions.

4.6 Emergency Operations Center External Communications and Interface

Two primary responsibilities of the City's EOC are to support the operations of field responders and to maintain City government services and functions during an emergency event. This requires the EOC to communicate and coordinate with the City's field responders, with external agencies responding to the event and with other governmental entities responding or providing services or resources. Agencies responding to the emergency may utilize a variety of facilities or personnel to manage the event, including:

- Shift supervisors (Watch Commander, Battalion Chief, other managers)
- Dispatch Centers
- Incident Commanders/Incident Command Posts (ICPs)
- Department Operations Centers (DOCs)
- Other jurisdiction EOCs
- Other City Department offices or facilities

Because the City's EOC is not frequently activated, communication between these personnel and facilities and the EOC is not a routine procedure, and requires a positive effort to maintain.

The purposes for communication between these personnel and facilities and the EOC include:

- Gathering and exchanging information on the status of the emergency situation
- Receiving and processing requests for resources needed for the response
- Preparing and distributing alerts and warnings or other emergency information to the public
- Providing policy direction and setting priorities for the response
- Formulating tasks and objectives to drive EOC operations
- Tracking of costs, damages and losses generated by the emergency

A variety of methods may be utilized between the EOC and other responding personnel and facilities. This is both to accommodate the differing communication systems normally used by these entities, and to provide alternative methods of contact in the event that communications systems that are normally used are disrupted by the emergency event. Communications alternatives include:

- A department or agency representative present in the EOC
- Phone communications, including landline, cell and satellite phones
- Radio communications, including Orange County Countywide 800 MHz radios, VHF or Operational Area Radio, or public amateur (ham) and FRS radios
- Email messages
- WebEOC internet-based incident management system
- Fax messages
- Face-to-face messengers

The table below provides a communication diagram of City departments and external agencies that the EOC most commonly needs to communicate and coordinate with, the purposes for which the EOC may need to communicate with the department or agency, and the possible methods of communication and interface between these agencies and the EOC. These listings are not exclusive, but represent the primary and most foreseeable agencies, purposes and methods of communication that the EOC should prepare for.

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Communication Interface Between the City of Santa Ana EOC and Field Responders or External Agencies			
	Purposes of Communication 1. Situation Status 2. Resource Needs / Requests 3. Public Information / Warning 4. Policy and Priority Setting 5. EOC Tasks and Objectives 6. Cost Tracking	Methods of Communication A. EOC Representative B. Phone: Landline/Cell/Satellite C. Radio: 800 MHz/VHF/Public D. Email * E. WebEOC * F. Fax* G. Messenger	*Notes *Email, WebEOC and Fax do not provide confirmation that the message was received. Separate confirmation is required.
City Departments / Agencies			
Police Department Watch Commander/Dispatch/ICP/DOC*	1, 2, 3, 4, 5, 6	A, B, C, D, F, G	*Whichever activate for the event.
Public Works Dispatch/ICP/DOC*	1, 2, 3, 4, 5, 6	A, B, C, D, F, G	*Whichever activate for the event.
Planning and Building Dispatch/ICP/DOC*	1, 2, 3, 4, 5, 6	A, B, C, D, F, G	*Whichever activate for the event.
Fire Authority Battalion Chief/Dispatch/ICP/DOC/Division 6*	1, 2, 3, 4, 5	A, B, C, D, E, F, G	*Whichever activate for the event.
Field Facilities Shelters/PODs/Staging Areas*	1, 2, 3, 4, 5, 6	A, B, C, D, F, G	*Whichever activate for the event.
City Contractors Maintenance/Cleaning/Repair/Security*	1, 2, 4, 6	B, D, F, G	*Whichever activate for the event.
City Departments w/o Field Responders	1, 2, 3, 4, 5, 6	A, B, D, F, G	
External Agencies			
Orange County Operational Area (OA)	1, 2, 3, 4, 6	A*, B, C, D, E, F, G	* Based on availability of EOC reps.
Santa Ana Unified School District & Police	1, 2**, 3, 4***, 5	A, B, C, D, E, F, G	**Generally passed through the OA EOC, when activated. ***For coordination, not binding.
Other Orange County OA Jurisdictions	1, 2**, 3, 4***	B, C, D, E, F, G	**Generally passed through the OA EOC, when activated. ***For coordination, not binding.
State and Federal Agencies	1**, 2**, 3**, 4**, 6**	B, D, F	**Generally passed through the OA EOC, when activated.

4.7 EOC Internal Communications and Documentation

4.7.1 Communications within the EOC

While specific decisions and assignments in the EOC must follow the chain of command illustrated in the EOC Organization Chart, all EOC staff are authorized and encouraged to communicate and exchange information with all other relevant EOC positions. The primary methods of communication within the EOC (between EOC positions) include:

- Face to face conversation – Face to face conversation is valuable for the speed of communication and instant acknowledgment and confirmation of the information exchanged.
- Telephone conversation – All EOC positions will have access to telephone landlines and most will also have cellphones. A telephone list will be prepared as part of the EOC staffing plan.
- Email – Email is valuable for exchanging documents or for lengthy or detailed messages.
- Message Slips – Written message slips can be also used for lengthy or detailed messages or when a written reply is requested.
- Radio Communication – EOC staff may have access to two-way radio communication; this may be helpful particularly for EOC staff that move about or change location frequently.

4.7.2 EOC Documentation

Activity Logs – Every person assigned to an EOC position will maintain a position Activity Log. The Activity Log is a written (paper or electronic) record to document all conversations, actions, requests, decisions, or assignments or directions given or received. Activity Logs include the date, time and identification of all parties to the action or communication. Activity Logs provide critical and invaluable documentation for:

- Future shifts/relief staff, who may need to continue, finish or follow up on previous actions taken.
- Justification for response costs or expenses that may be eligible for state or federal reimbursement.
- Preparation of After Action Reports to identify needs/gaps and improve plans for future incidents.
- Defense against liability or claims of inadequate or insufficient response to the emergency.

Position Folders – Each EOC position will maintain a file folder for each shift or operational period, as a place to maintain Activity Logs and copies of all documents or written communications. The file folders will be maintained at the EOC position throughout the duration of the EOC activation for reference. Upon deactivation, folders will be collected by the Documentation Unit for preservation.

Chapter 5 – Disaster Recovery

5.1 Recovery Overview

Recovery from disaster is unique to each community and depends on the type and extent of damage caused by the incident and the resources that the jurisdiction can bring to the recovery effort. In the short term, recovery is an extension of the response phase in which basic services and functions are restored. In the intermediate and long term, recovery is a restoration of both the personal lives of residents and the livelihood of the community. Actions are taken to help individuals, households, businesses, communities, and governments return to a normal level of function.

Recovery operations include developing, coordinating, and executing plans to restore City facilities and infrastructure; reconstituting government operations and services; establishing programs to provide housing and promote rebuilding; long-term care and treatment of affected persons; and additional measures for social, political, environmental, and economic restoration. Disaster recovery also involves incident-related cost recuperation, identification and implementation of mitigation measures to reduce or eliminate effects of future incidents, and evaluation of lessons learned.

Disaster recovery can begin shortly after the disaster occurs. Even as the immediate imperatives for response to an incident are being addressed, the need to begin recovery planning emerges. Once immediate lifesaving activities are complete, the focus shifts to assisting individuals, households, critical infrastructure, and businesses to meet basic needs and return to self-sufficiency. The emphasis upon response will gradually give way to recovery operations. Disaster recovery can generally be divided into three phases: short-term, intermediate-term, and long-term.

Short-Term Recovery - Short-term recovery is activity to return vital life-support systems and critical infrastructure to minimum operating standards. This may range from a few days to weeks following a disaster. Key objectives of short-term recovery are to restore the community to a functioning, if not pre-disaster, state. Activities may include damage assessment, debris clearance, sheltering or relocation of impacted populations and businesses, restoration of services and utilities, temporary financial relief to affected populations, immediate abatement of extreme hazards, and crisis counseling. Emergency repairs and temporary reconstruction may occur during this period.

There will be pressure to resume essential services and pay prompt attention to residents' needs and requests. In some cases, plans may include secondary service agencies that can be brought in (such as through mutual aid or disaster relief organizations) to provide services during a prolonged disruption. Continuity of operations, business continuity, and continuity of government plans are often developed to enable short-term recovery priorities. Short-term recovery typically overlaps with both the emergency response and intermediate recovery phases.

Intermediate-Term Recovery - In the intermediate phase of recovery, the most vital services have been restored, but life would not be characterized as back to normal. This period, which can range from weeks to months after the event, may overlap with both short-term and long-term recovery. Displaced persons may need to transition from emergency shelters to temporary housing solutions; government, schools and businesses may have re-opened but may be operating at a reduced scale or from temporary facilities; and transportation arteries may be open but not fully restored. The City and private organizations and individuals may have applied for financial assistance but have not yet received payments. During intermediate recovery, actions may be taken to address specific conditions, such as requests for utilities to provide bill relief; waivers or postponements of fees, payments or deadlines for government services or regulations; a need to establish temporary housing and business spaces; altered traffic patterns; and

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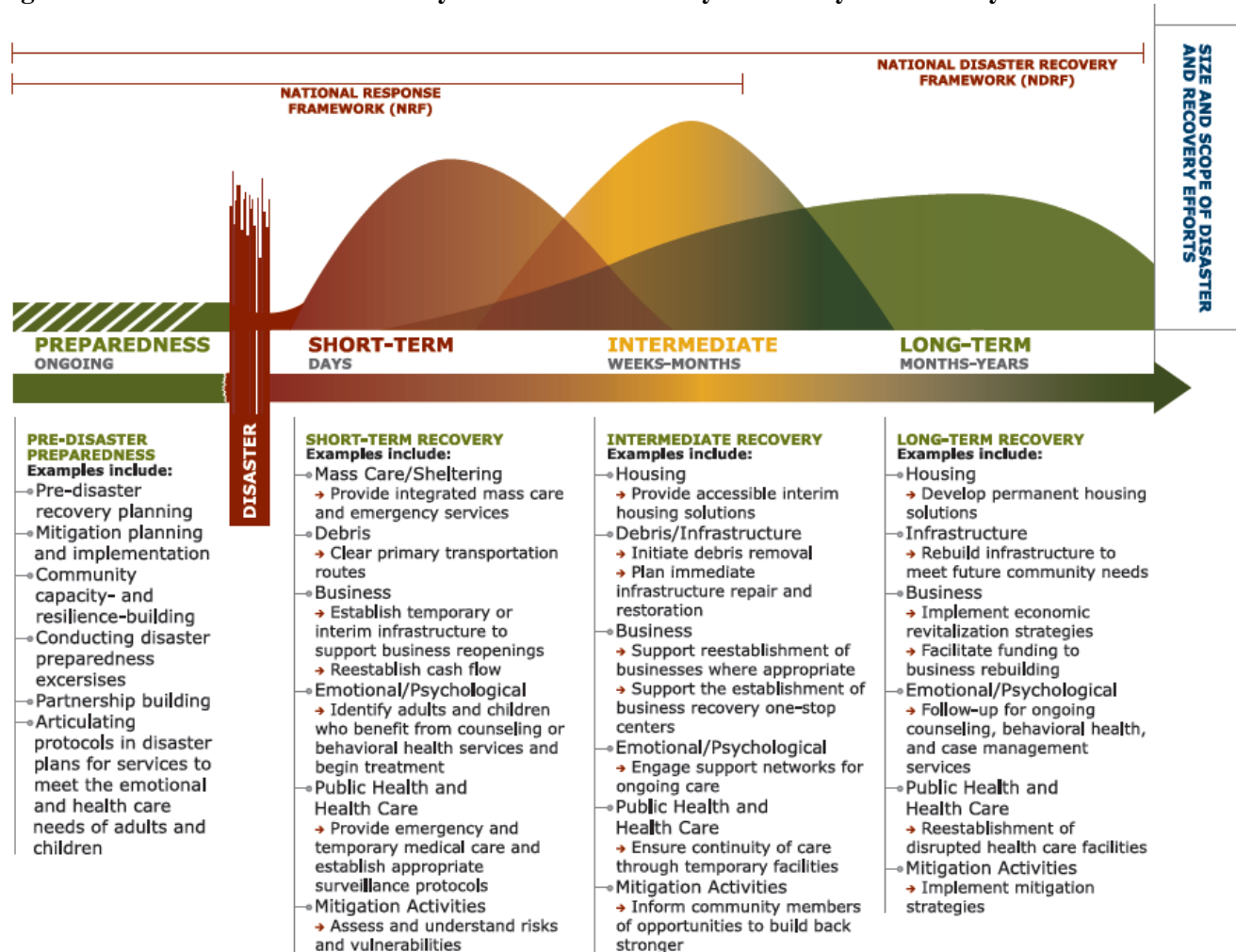
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extended and expanded mass care services. Behavioral health services become paramount during this time as the affected population experiences stresses related to coping with ongoing disaster effects.

Long-Term Recovery - Long-term recovery spans months to years after the event depending on the severity and extent of the disaster damages and the availability of resources to address needs. It is the process of re-building or re-creating damaged or destroyed social, economic, natural and built environments in the community to conditions of self-sufficiency, sustainability and resilience, and may include:

- Addressing recovery needs across all sectors of the economy and community as well as addressing individual and family recovery activities and unmet needs.
- Planning and re-construction of City facilities and infrastructure and public or private utilities.
- Planning and re-construction of permanent housing solutions and commercial properties.
- Rebuilding to appropriate resilience standards in recognition of hazards and threats.
- Implementing hazard mitigation plans and projects to minimize future disaster impacts.
- Implementing economic and business revitalization strategies.
- Developing and implementing plans to address long-term environmental and land-use goals.

Figure 160 National Disaster Recovery Framework Recovery - Recovery Activities by Phase



5.2 Transition to Recovery

Transition from response to recovery is a gradual process, the pace and timing of which will depend upon the circumstances. As response activities diminish, recovery activities will increase. If the scope of the event dictates, a separate Recovery Organization may be established to manage recovery operations. The response phase Director of Emergency Services (DES-Response) will make the decision as to when to transfer to recovery operations and establish a Recovery Organization. This may include the appointment of a different DES for the recovery phase (DES-Recovery).

The Recovery Annex to this EOP details a coordinated system for recovery operations, identifies operational concepts, and provides an overview of organizational structures to bridge the gap between implementing this EOP during an emergency and a full return to normal conditions and operations.

5.2.1 Recovery Annex Activation and Implementation

The determination to formally transition from the Emergency Operations Plan to the Recovery Annex will be made by the response phase DES, using the following criteria as a guide:

- Immediate life safety and property protection concerns associated with the event have been contained or resolved.
- Demand for services on City, other government and/or non-governmental entities still exceed the capability of these entities due to continuing unmet needs from the response phase or new needs arising from recovery processes.
- The situation is expected to persist for an extended period of time.
- The City, County and/or the Operational Area have requested the Governor proclaim an emergency and requested a declaration of emergency from the President, under the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The transition from response to recovery may be gradual and involve multiple smaller transitions:

- Elements of short-term recovery begin with EOC activation and implementation of the EOP.
- As recovery-specific objectives begin to be identified through the Action Planning cycle, the DES-Response will begin the transition of recovery activities to the Recovery Organization.
- Coordination of recovery operations will transition from the EOC to a virtual or alternate Recovery Coordination Center. Some recoveries may be managed from normal City worksites, but major catastrophic emergencies will require a long-term facility to be established.
- The DES-Recovery will formally activate the necessary Recovery Organizational elements.
- The DES-Recovery will take command of the Recovery Organization. This includes any response resources that have yet to complete their response objectives, along with the initiation of recovery objectives and Recovery Organization resources.
- Once all response operations have been deactivated, the transition phase will be complete.

Recovery staff and assets will be deactivated and/or returned to normal operations at the discretion of the DES-Recovery. The determination may be based on completion of operational objectives, the determination that such objectives can be accomplished without support or coordination from a formal Recovery Organization, or otherwise determining that aspects of recovery can be fulfilled through normal business operations. After the Recovery Organization is demobilized, any incomplete goals identified in Recovery Planning will be assumed by the appropriate City department or agency.

5.3 Recovery System Organizational Structure

The Recovery Annex to this EOP provides an organizational framework to transition the response function into the recovery function, managed within a Recovery Organization. The Recovery Annex details the organization of the City's recovery system, which is similar to the ICS structure utilized during response operations but with the differences necessary for recovery duties. Departments with a heavy presence in emergency response take on secondary support roles during recovery. Departments and organizations with recovery-focused duties (including planning, building, zoning, infrastructure and facilities restorations, and economic development) take on a heightened level of responsibility in the recovery phase. The Recovery Annex to the Orange County Operational Area EOP is also highly relevant to the recovery process, as many recovery functions (e.g. public health and medical care, social services, regional coordination) will be managed at the County and Operational Area level.

Recovery Governance and Command - City leadership will be responsible for organizing, coordinating, and advancing recovery of the City. The DES-Recovery will oversee the Recovery Organization on a day-to-day basis. This DES-Recovery may be the City Manager, an Executive Director from a City Department most heavily impacted by the disaster, or may be an Executive Manager brought on for the recovery effort, and this may require a full-time focus or appointment.

Various City staff may be detailed to the Recovery Organization on a full or part time basis depending on the situation. Recovery Organization staff may need to be relieved of their permanent job duties for the duration of their recovery role. During recovery, City personnel may be assigned positions in a Recovery Organization, or they may be given mission assignments by the Recovery Organization.

All City departments may be responsible for carrying out some aspect of recovery and assisting in preparing the City's Recovery Plan. Departments may be expected to defer some normal day-to-day operations in order to carry out functions during recovery or to provide recovery assistance to other departments or agencies. The City will also use a wide array of established relationships, both within and outside of government, at the county, regional, state and federal level. Some departments and agencies may be designated to coordinate or assist in coordinating recovery functions between the City and outside agencies. In the event that a request impedes the ability of the department or agency to fulfill its normal primary and non-deferrable mission, the DES-Recovery has the authority to make a final decision to divert a department's resources from its normal primary and non-deferrable mission to recovery support activities.

The cost of Recovery staff and tasks will be borne by their home agencies; some costs may be eligible for reimbursement under State or Federal programs or other funding mechanisms provided by the City.

5.3.1 Recovery System Organizational Chart

The Recovery Organization is structured on the principles of SEMS, NIMS and ICS, including:

- It will be scalable and flexible to adapt to the size and scope of the disaster recovery effort;
- Only positions that are needed will be activated;
- Each activated position will be filled by whoever has the right skills and experience for that event;
- Responsibilities of any positions that are not activated will revert up the chain of command to that position's supervisor;
- The staffing, scale, and structure of the temporary Recovery Organization may expand, change, or contract over time, as indicated by the situation;
- Supervisors will maintain a manageable span of control over subordinates and subordinates will have one supervisor to report to.

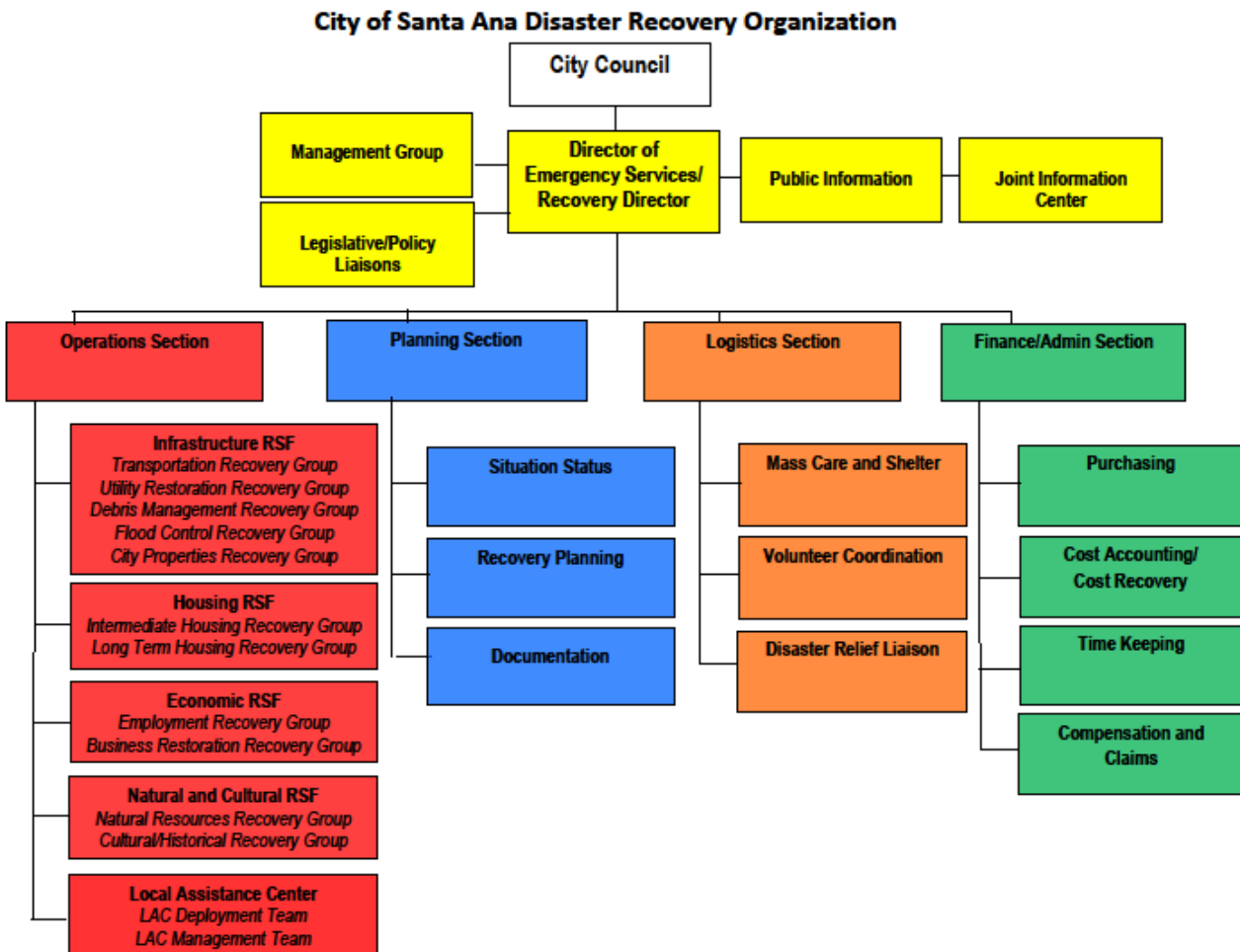
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The Recovery Organization consists of the five functional areas of SEMS and ICS systems: Management, Operations, Planning, Logistics and Finance/Administration. Because of the widespread, interdepartmental and interagency nature of recovery, the Recovery Operations Section is constructed of Recovery Support Functions (RSFs). An RSF is an assembly of various staff, departments and agencies (City and external), similar to a task force, required to fulfill specific recovery missions. For example, a Transportation Recovery Group within the Infrastructure RSF may include:

- City of Santa Ana Public Works Agency, Street Maintenance Division
- City of Santa Ana Public Works Agency, Engineering Services Division
- City of Santa Ana Public Works Agency, Traffic Management Division
- City of Santa Ana Planning and Building Agency
- Other City Departments
- Orange County Transportation Authority
- California Department of Transportation
- Private Contractors

Recovery Sections, RSFs, Recovery Groups and other positions are assembled based on the needs of the specific event; they are not pre-determined position assignments as the EOC Organization Chart is.

Figure 163 City of Santa Ana Disaster Recovery Organization



5.4 Recovery System Roles, Responsibilities and Assistance Programs

5.4.1 City of Santa Ana

The City will organize recovery operations according to needs identified and priorities established by City leadership in the transition from emergency response to recovery. The City may work with neighboring jurisdictions to share resources or address common problems. Regional entities may also play a role in setting priorities and obtaining resources for recovery within their respective areas of authority.

Recovery efforts for the City recovery may include these focus areas:

- Complete damage and safety assessments.
- Provide security to impacted areas and maintain law enforcement functions.
- Restore transportation routes and systems.
- Restore or assist in restoring services such as power, water/wastewater, gas, and communications.
- Assess damage to public facilities and infrastructure; initiate temporary and permanent repairs.
- Assess the housing situation, identify potential solutions, and request needed support.
- Assess damage to private property and issue permits for repairs and demolitions.
- Remove debris from public properties and roadways; provide private property debris collection.
- Provide disability related assistance and functional needs support services.
- Assist with identification of temporary housing and business space.
- Assist with reestablishment of schools and childcare centers.
- Work with State and Federal officials to assess damage, identify needs and secure financial assistance.
- Activate Local Assistance Centers (LACs) to assist individuals, households, and businesses.
- Facilitate State and Federal disaster program assistance to residents and businesses.
- Document disaster-related costs for reimbursement through State and Federal grant programs.
- Resume governmental functions and City programs and activities.
- Begin planning for long-term community recovery.
- Enact appropriate zoning variances to accommodate business and commercial repairs.
- Establishing a post-disaster recovery prioritization and planning process for restoration of economic and social systems of the community.

5.4.2 County of Orange

The County of Orange is the lead agency within the Operational Area with the responsibility to coordinate information, resources, and priorities among local governments. The County also serves as the coordination and communication link between OA jurisdictions and the Cal OES Southern Region.

The roles and responsibilities for the County of Orange and its departments and agencies differ for the incorporated and unincorporated areas of the county. Unless otherwise specified, the various county departments and agencies will coordinate recovery activities for incorporated areas and will direct and implement recovery operations for unincorporated areas.

In general, the Orange County Operational Area will coordinate with local and external jurisdictions and partners in a variety of ways. These include, but are not limited to the following:

- Sharing information through periodic conference calls, situation reports, briefings and other verbal and electronic means of communications.

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- Hosting interagency coordination meetings, community stakeholder forums and task force workshops, to ensure information and strategies are shared collaboratively.

5.4.3 Individuals and Households Actions

Individuals and households will stabilize their circumstances by establishing adequate transitional or permanent shelter, assessing damage to their property and initiating repair or rebuilding, resuming work and other regular activities, obtaining insurance proceeds, and applying for assistance programs.

5.4.4 Private-Sector Actions

The private sector engages in activities necessary to resume business operations—including assessing damage, implementing continuity of business plans, caring for employees, shifting operations to temporary facilities or locations, obtaining insurance proceeds and applying for assistance programs. In coordination with the Operational Area and local governments, businesses also may play a key role in donating goods and services for community recovery.

5.4.5 Nongovernmental Organizations Actions

NGOs, community-based organizations, and faith-based organizations such as the American Red Cross or Salvation Army are members of the Collaborative Organizations Active in Disaster, Orange County (COAD-OC). These organizations provide support to individuals and households displaced by a disaster and will work with governmental organizations to support the transition from care and shelter operations to interim housing arrangements. Such groups include churches, neighborhood health clinics and food distribution agencies. NGOs and community-based organizations may provide a range of services such as donations management; emergency food, clothing and shelter; as well as support of housing reconstruction. They provide these services independently or in coordination with local, state and federal efforts.

5.4.6 State Government Actions

When a State of Emergency is proclaimed in counties affected by a disaster, Cal OES will lead California's recovery operations and coordinate assistance provided by other State agencies and the Federal government. Other State agencies may provide support to local governments under their respective authorities or under other Federal programs. These State agencies coordinate their activities with Cal OES but may direct operations from their respective department operations centers. When Federal assistance is required, Cal OES will work with FEMA and other Federal agencies to ensure effective delivery of services. The Governor appoints a State Coordinating Officer (SCO) to coordinate the State's requests for Federal assistance and interact with Federal officials.

5.4.7 Federal Government Actions

The Federal government provides recovery support under the National Disaster Recovery Framework (NDRF) following a Presidential disaster declaration, and immediately mobilizes resources in anticipation of likely needs and provides those resources to state and local governments upon request from the State. FEMA coordinates Federal recovery operations:

- In accordance with the Stafford Act, the President appoints a Federal Coordinating Officer (FCO) and may appoint a Federal Disaster Recovery Coordinator to manage Federal operations and coordinate recovery programs.
- At the request of the State, FEMA coordinates direct Federal assistance to State and local governments through a system of designated Emergency Support Functions (ESFs).

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- As resources and conditions allow, Cal OES and FEMA establish a Joint Field Office (JFO) to manage and coordinate recovery operations. In general, all emergency support functions (ESFs) that support Federal recovery efforts operate from the JFO once it is activated. Cal OES and other State agencies deploy staff to the JFO to ensure effective coordination with their Federal counterparts.
- FEMA may establish Disaster Recovery Centers (DRCs) to centralize public outreach operations from Federal agencies and their respective assistance programs and to supplement Local Assistance Center (LAC) operations. Cal OES, FEMA, and the local jurisdiction(s) coordinate on the location(s) of LACs and DRCs to best meet the needs of the communities affected by the disaster.
- Under the Stafford Act, FEMA coordinates Federal recovery programs, which may include:
 - Assistance for individuals and families through the Individual and Household Program (IHP), including provision of temporary housing.
 - Assistance to local and State governments and certain private nonprofit organizations for extraordinary costs related to response, removal of debris, and damage to buildings and infrastructure through the Public Assistance Program.
 - Assistance to local and State governments for measures to reduce damage from future disasters through the Hazard Mitigation Grant Program.
- Other Federal agencies may implement non-Stafford Act recovery programs or programs authorized under disaster-specific legislation, including the following:
 - The Small Business Administration (SBA) may provide low-interest loans for repairs to damaged homes and businesses.
 - The Federal Highway Administration (FHWA) may provide funding to local and state governments for restoring damaged roads, bridges and other features that are part of Federal-aid routes.

5.5 Recovery Facilities

Physical sites and facilities associated with Recovery are described below. These sites may be established, supported and maintained individually by the City or on a regional basis serving multiple jurisdictions.

5.5.1 City Recovery Coordination Center

A Recovery Coordination Center (RCC) may be established to plan and manage the recovery process, support the damage assessment process, ensure documentation of disaster-related operations and expenditures, and provide for coordination with the OA, Cal OES and FEMA on recovery program issues and implementation. It will serve as the management and coordination center for all City recovery activities and to facilitate coordination with RCCs established by other jurisdictions and with local, State and Federal agencies contributing to the recovery effort.

The DES, in consultation with the Finance & Administration Section Chief, will begin planning to establish the RCC as soon as it is determined that significant interagency disaster recovery resources and coordination are necessary. Initial recovery activities may be coordinated from the EOC until the RCC is in place.

For a long-term recovery effort, the RCC may require acquisition of office and meeting space for a fully dedicated recovery effort. For more moderate recovery efforts, the RCC may be established within existing City spaces or with City staff working from their existing departments in a virtual RCC arrangement.

5.5.2 Local Assistance Centers

One or multiple Local Assistance Centers (LACs) may be established in coordination with the Operational Area, neighboring jurisdictions and State and Federal agencies. LACs are staffed with representatives of local, county and state agencies; disaster relief organizations and other service providers to provide a

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convenient “one-stop shop” for those impacted by the disaster so they can access recovery assistance and/or referrals to other programs and assistance that may not be represented. Federal agencies may also provide representatives who can provide information regarding Federal disaster assistance programs.

Consideration and services for people with disabilities and those with access and functional needs should be incorporated into LAC sites, including the following:

- Compatibility with Occupational Safety and Health Administration (OSHA) requirements.
- Compatibility with the Americans with Disabilities Act requirements.
- Close proximity to individuals and families affected by the disaster.
- Convenient access by public transportation.
- Secured, lighted parking areas and walkways.
- Multilingual, pictograph and large-print signs.
- Materials and forms to be available in alternate language formats, including large print, braille, audio, and electronic.

When applications need to be completed onsite, procedures should be in place to assist people with disabilities or access and functional needs, including reading of materials and filling out forms.

5.6 Damage Assessments

Damage assessment is a crucial function serving critical needs in both the response to and recovery from disaster events. A thorough and accurate assessment of losses and damages incurred serves two primary purposes. First, damage assessment provides the EOC and City leaders with information necessary to set priorities, establish objectives, and acquire and allocate resources to most effectively and efficiently respond and recover. Second, damage assessment documentation provides the primary basis for requesting State and Federal resources and financial assistance, for the City and for residents and businesses.

Two City Departments have responsibility for performing damage assessments. First, the Public Works Agency has primary responsibility for assessing damages to public infrastructure, including streets and roadways, water and sewer systems, flood control channels and storm drains, and other City-owned public infrastructure systems, and for assessing damages to all City-owned buildings and properties that are not part of public infrastructure systems. Other City Departments may be enlisted to assess their own properties. Second, the Planning and Building Agency has primary responsibility for damage assessments to all privately-owned properties and structures, including all residential and commercial properties.

Damage assessments for structures and properties in the City that are owned by another governmental entity, including Santa Ana Unified School District, Rancho Santiago Community College District, the County of Orange, State of California or United States, are the responsibility of that governmental entity. However, the City may be asked to provide mutual aid assistance toward those agencies’ damage assessment processes, and the results of all damage assessments should be shared since the results may affect City plans, objectives and resources.

Damage assessment results are tabulated and documented in the City EOC. Specifically, the EOC Planning & Intelligence Section will depend on these results to prepare objectives, action plans, resource requests and situation reports. The EOC Finance & Administration Section will depend on these results to prepare Cost Accounting summaries and prepare Cost Recovery applications and documentation. These results may also affect the EOC Operations Section’s implementation of plans and objectives and the EOC Logistics Sections fulfilling of resource requests.

5.7 Recovery Documentation

The California Disaster Assistance Act (CDAA) and the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) may provide, respectively, State and Federal reimbursement to the City of a large portion of the City's costs in responding to the disaster and reimbursement of losses or damages to City properties and facilities incurred in the disaster. Categories for reimbursement include:

- A: Debris removal;
- B: Emergency response and protective measures;
- C: Damage to roads and bridges;
- D: Damage to water control facilities;
- E: Damage to buildings and equipment;
- F: Damage to utilities systems;
- G: Damage to parks, recreational and other facilities.

To receive these reimbursements, detailed documentation must be maintained of all damages to City properties and of all costs in responding to the emergency, including but not limited to staff time, City supplies and equipment utilized, supplies and equipment rented or purchased, contractors hired, or any other expenses incurred. The City's Finance and Management Services Department has primary responsibility for developing procedures to document and track City losses and costs, and each Department is responsible for implementing cost tracking for its own costs.

Additionally, detailed documentation of damage assessments of private property damaged in the disaster forms the primary basis of eligibility for federal assistance programs and other disaster relief to residents and private properties. The City's Planning and Building Agency has primary responsibility for developing procedures to document and track private property damages and losses.

5.8 After Action Reports

Section 2450(a) of California Standardized Emergency Management System Regulations requires that, for any emergency for which the City has proclaimed a Local Emergency and the Governor has also proclaimed a State of Emergency, the City is required to complete an After Action Report (AAR) and submit it to the California Office of Emergency Services within 90 days of the close of the emergency incident period.

In some cases, the County of Orange may proclaim a Local Emergency on behalf of the Orange County Operational Area as a whole, with no proclamation by the City. For this, the City does not complete its own AAR, but if the City participated in the response to the emergency directly or through mutual aid, the City shall provide input and collaboration toward the Operational Area AAR.

An After Action Report shall address six factors related to the emergency response:

- Review of response actions taken, to memorialize the response for future reference, to identify lessons learned, to discover actions to improve future responses, and to identify any gaps in resources or capabilities;
- Review of SEMS application to the response, to ensure its proper application;
- Suggested modifications to SEMS practices or procedures to be forwarded to Cal OES;
- Evaluation of plans and procedures executed during the response, to identify needed changes;
- Identification of any training needs; and
- Documentation of recovery activities taken to date.

A Local Government AAR Template is available on the Cal OES, Recovery Division website, along with an address for submission of completed AARs.